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magazine of modern construction



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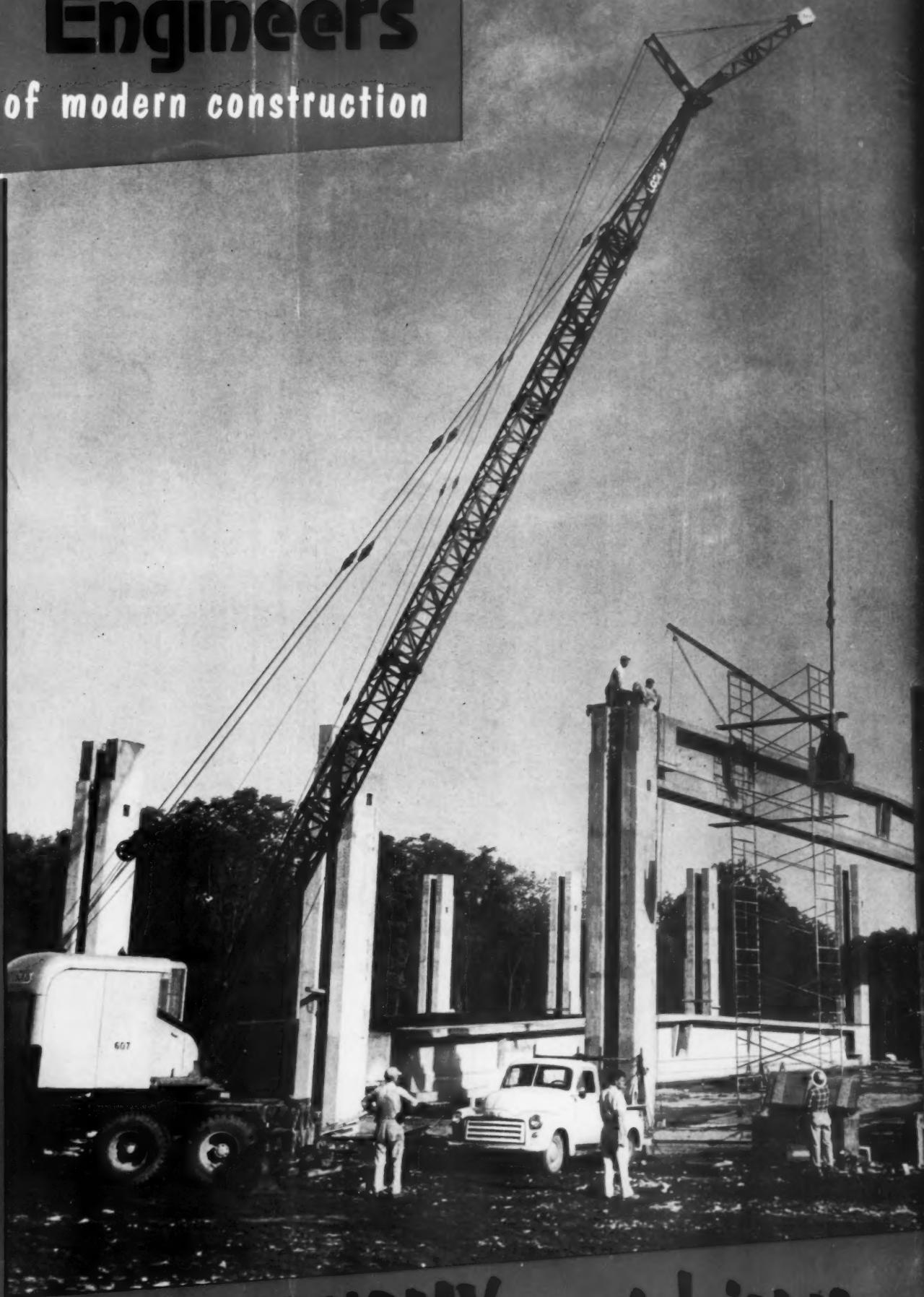
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EFFICIENCY and ECONOMY special issue

CONTRACTORS! CITY, COUNTY, STATE OFFICIALS! UTILITY, INDUSTRIAL OFFICIALS!

City of Oshkosh, Wisconsin
"HEART OF WINNEBAGO LAND"

December 6, 1955

J. P. Waite, Inc.
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Gentlemen:

Att: J. P. Waite

Our Model 2460 Gradall is now about to celebrate its second birthday and I think that it is about time to tell you of the many things we have done with it, and the money it has saved us.

When taking out curb and gutters with the Gradall, we have been able to eliminate an air compressor and 4 men and get the job done much more quickly.

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Yours very truly,

Wm. Hubbard
William H. Hubbard, Supt.
City Street Department

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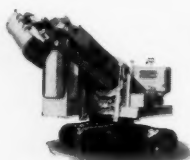
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Contractors and Engineers

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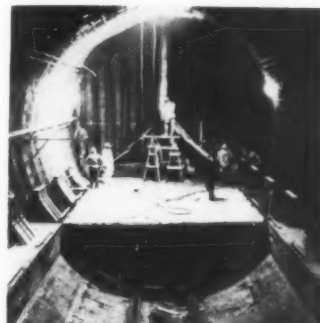
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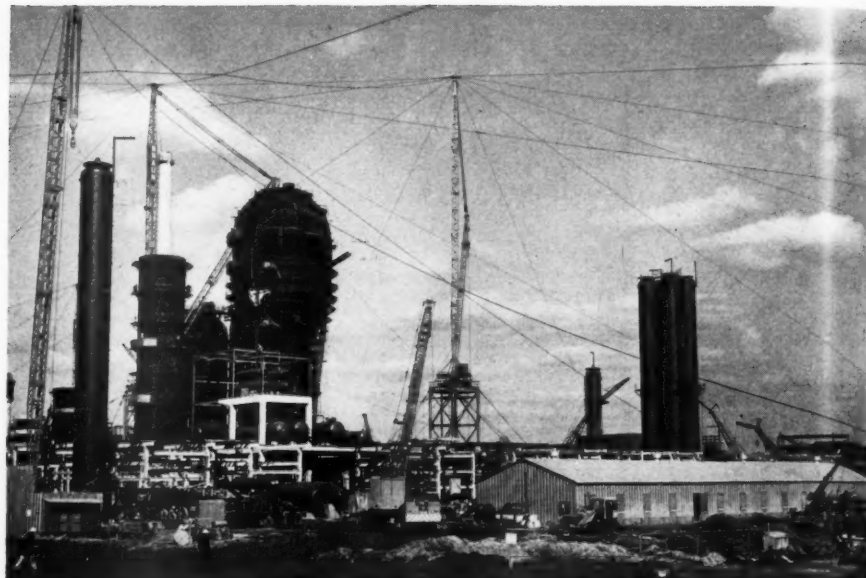


Construction know-how

In this issue we are giving special attention to cost-cutting and time-saving ways and means that develop efficiency and economy in the construction industry. For convenience, major articles have been classified by the six big M's of construction—machinery, materials, methods, maintenance, men, and management—and every reader should find something in one or more categories to help him in his work. In addition to the articles, numerous case histories illustrate cost-saving operations with one or more of the big M's.

Gathering data and photos in reporting on construction projects, and presenting useful information to the reader is one of the major functions of a trade journal. We therefore find it difficult to understand the recent attempt of a couple of well-known construction firms to withhold information on some of their projects from the technical press. The reason advanced for this curious attitude is that the competition will copy their "trade secrets" from articles published about their work. On big jobs, such as these are, there is no positive way of concealing the methods or equipment used from a rival contractor who is determined to have a look.

These projects, moreover, are civil public works and cannot be closed off completely to observers, as might be possible with military installations or facilities being financed by private industry. We can understand, for instance, the possible reluctance of a new plant owner to reveal an assembly line layout. But public construction



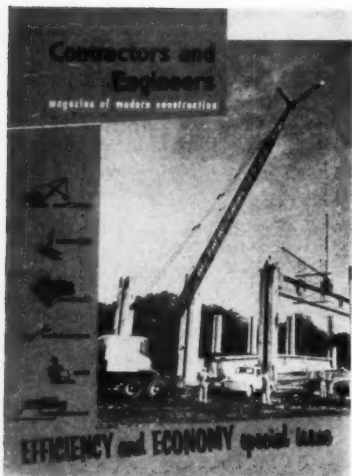
can hardly be compared with a manufacturing process.

In 99 cases out of 100, contractors are pleased to show fellow contractors around their jobs. During the good-natured banter that usually accompanies such visits, the holder of the contract may even pick up some useful tips or advice from his friendly competitors. If he has come up with a particular device of his own or an employee's invention, he can always have it patented so that he retains the exclusive right to use, manufacture or sell the device, as he chooses.

Construction firms tell us they keep up with current practices by reading reports in technical magazines about jobs handled by their competitors, or any contractor for that matter. In the civil engineering profession, from which the construction industry springs, the engineer is honored to present or have published a paper in which his work may be described in detail. Architects are proud to exhibit

their designs, unafraid of being copied, and secure in the belief that they can do a different and better job on their next assignment. How far would medical science have advanced if each physician kept to himself any particular knowledge he had acquired in the art of healing?

From a public relations viewpoint, any construction organization is bound to profit by having its projects publicized—assuming, of course, that the firm is giving the owner or agency a good job. It gains public acceptance for its services, and enhances its qualifications in the eyes of future potential customers. Such a firm does not necessarily have to possess a corporate conscience, or be moved altruistically in order to let its know-how receive proper recognition. In its own self-interest it should want the spotlight thrown on its activities. This country enjoys a free press; it abhors censorship. It wants no concrete curtain in the construction industry.



Reinforced, precast, prestressed concrete girders, 146 feet in length, are joined to columns to form a rigid building frame for the gym of a \$1½ million high school in Springfield, Mo. Templeton-Kenly Simplex 100-ton jacks—used to prestress the girders then lift them

into place—are being transferred from one concrete column to another by a Lorain truck-crane with 90-foot boom and 15-foot jib. A Patent scaffold tower provides access to the tops of the columns. Page 52.

CONTRACTORS AND ENGINEERS

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CONTRACTORS AND ENGINEERS

The greatest construction measure in history

A 13-year, \$51,860,000,000 road-building program, calling for a rise of almost \$29,000,000,000 in the rate of federal and state expenditures, may be ready to start by the first of next month. Various versions of a big highway program, as embodied in bills under consideration by Congress for the past two sessions have given way to one. This is the Fallon Bill, or HR 10660, that last month passed the House by a vote of 388 to 19. Senate approval, with modifications, is expected to get the measure on the way to the President for his signature before the end of this month.

As it now stands, the House-approved bill calls for the Federal government to lay out \$37,610,000,000 for roads in 13 years. The states, which will have charge of construction, would contribute \$14,250,000,000 in a like period, making the total come to \$51,860,000,000.

Of this total, \$25,000,000,000 in Federal funds is for completion of the 40,000-mile interstate system that will link 90 per cent of the nation's cities with a population over 50,000. This amount is 90 per cent of the cost of the system; the remainder will be paid by the states.

Federal-aid primary and secondary systems will get \$10,500,000,000 in Federal funds, this amount to be matched by the states on a 50-50 basis. Park, forest, and other roads financed entirely by the Federal government will get \$1,200,000,000. Standby emergency money, funds for rights-of-way, and miscellaneous items account for the remainder of the money.

Pay-as-you-go plan

The method of financing—one of the most controversial issues of a road plan—has been put on a pay-as-you-go basis by the bill. This means higher taxes for auto users for a 16-year financing period. The bill calls for taxes to go from 2 to 3 cents per gallon on gasoline, diesel, and special fuels, and from 5 to 8 cents per pound on tires and tubes. A new 3-cent per pound tax on camelback, and a new tax of \$1.50 per 1,000 pounds of vehicles weighing more than 26,000 pounds is included in the measure, as well as an excise tax increase on trucks, buses and trailers that will jump from 8 to 10 per cent. These new taxes and increases in old taxes are expected to yield \$38,740,000,000 in revenue to help pay for the new program.

How much this House-approved bill will resemble the final legislation now depends on the Senate. Last year the Senate passed the Gore Bill, and indications are that many of the provisions of this bill will be incorporated into the new legislation. However, the differences between the bills is not so great that they cannot be ironed out

by a committee of conferees of both houses of Congress.

There are three major points of difference between the bills. The first concerns the Davis-Bacon provision, approved by the House, which calls for laborers and mechanics working on a road to be paid wages that are in keeping with those prevailing in the immediate vicinity. The second concerns the method of paying for pri-

mary and secondary road work. The Gore Bill specifies 5-year definite authorizations, while the Fallon Bill provides a 2-year program with \$1,500,000,000 in Federal aid. However, it contains a declaration of Congressional intent that the program be continued with annual increases of \$25,000,000 through 1969. The third point of difference concerns the method of apportioning Federal-aid funds for

the interstate system. The Fallon Bill would have money go to the states on the basis of their needs; the Gore Bill would have money paid out under the formula now in effect for the system.

Though there still remains doubt as to the final form of the legislation, one thing is clear: the U. S. will soon be getting a much-needed multimillion-dollar road building program.

THE END



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A flexible pavement such as this Texaco asphalt highway, maintains complete and lasting contact with its subgrade. This means that it has the full support of the subbase at all times. Consequently, the flexible pavement withstands the load and impact of traffic longer than non-flexible pavement and at a lower upkeep cost.

For the base of this 8-mile Minnesota highway, low-cost Texaco asphalt construction of the road-mix type was used. A Texaco Medium-curing Cutback Asphalt and gravel were mixed on the subbase, spread to the desired thickness and compacted.

For the wearing surface, heavy-duty Texaco asphaltic concrete construction of the plant-mixed type was laid, using a 150-200 penetration asphalt cement in the mix.

Whatever the volume and weight of traffic served, Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the road builder one or more types of construction exactly suited to his requirements. Helpful information about all of these types has been incorporated in two free booklets, which can be secured by writing our nearest office.



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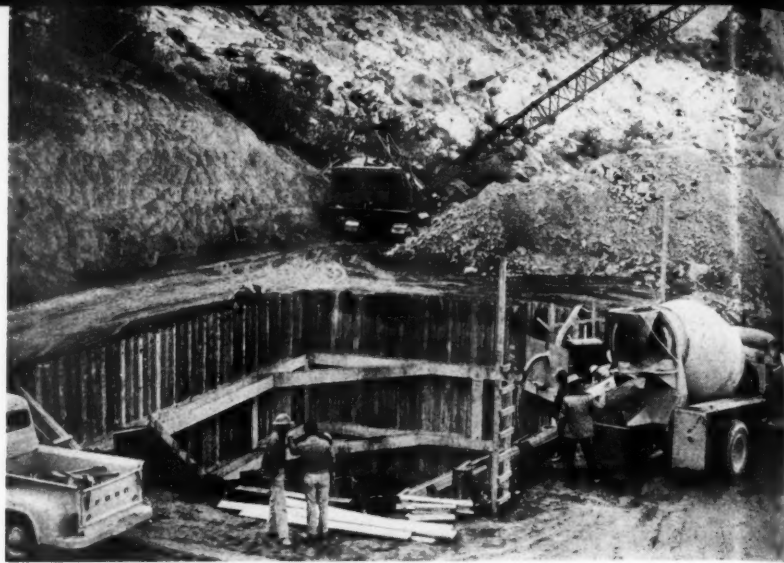
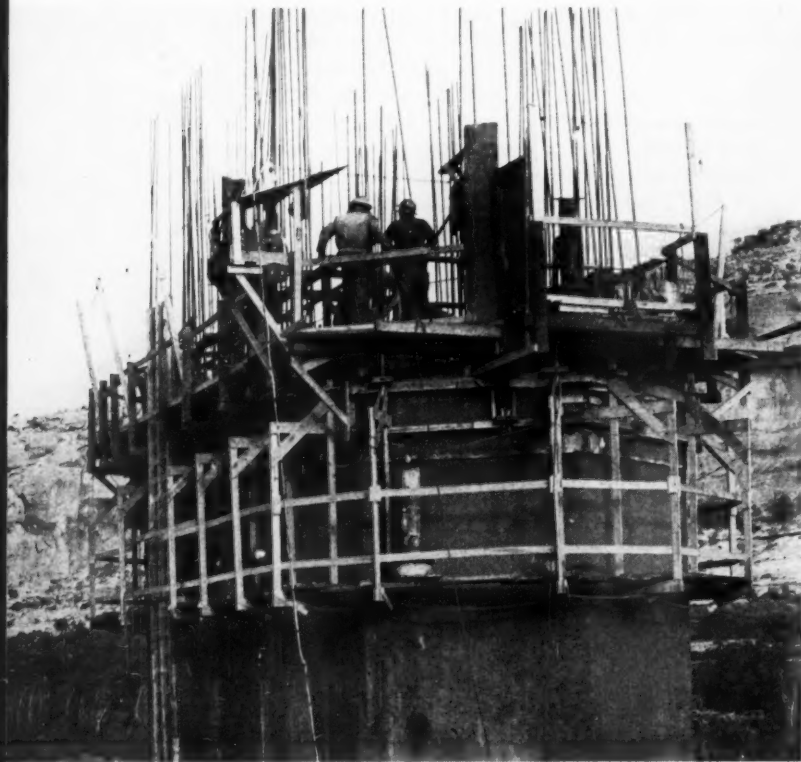
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TEXACO ASPHALT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 351

1. Concrete is chuted to a pier footing which is bedded 6 feet deep in limestone. Footings were constructed inside sheet pile cofferdams.

2. The slip forms start up the bottom section of the pier. Forms for the three-section piers were supplied by B. M. Heede, Inc., Long Island City, New York.



Hydraulically-jacked slip forms, used for the first time on a bridge job in this country, kept concrete work moving fast and insured monolithic construction of two 210-foot-high piers for the new span across the Pecos River near Langtry, Texas.

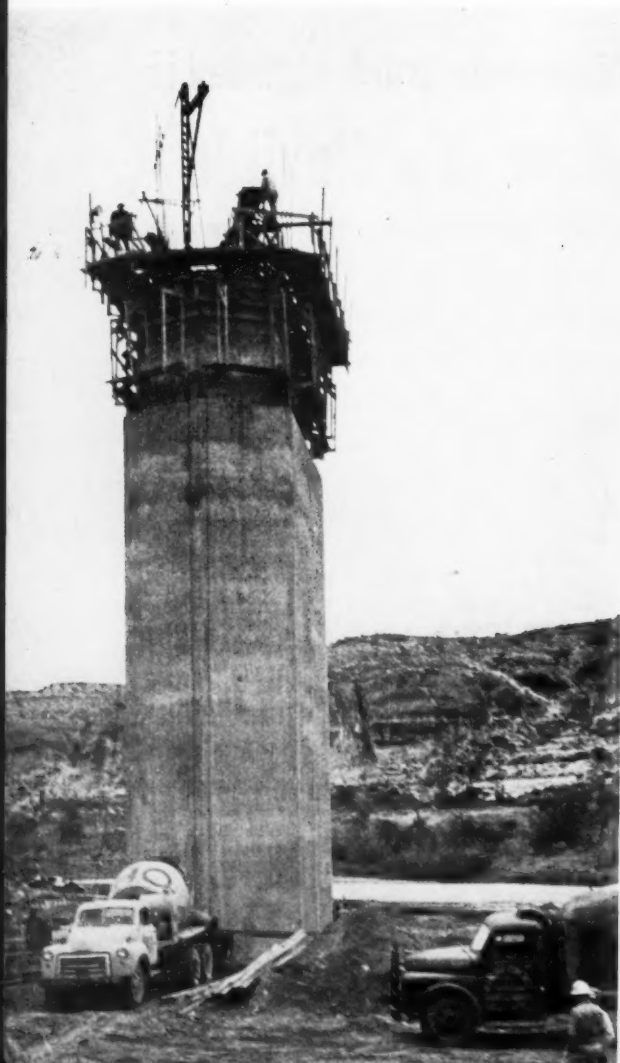
The method had already proved practical in Europe, where it saved both construction cost and time, when Whittle Contracting Co., Dallas, Texas, employed B. M. Heede, Inc., Long Island City, N. Y., as a consultant on this \$1,269,268.75 Texas State Highway Department contract.

First introduced into this country in 1949 by Heede, this system was

first limited to the construction of storage silos and buildings. Though high bridge piers have been built in this country with slip forms, all of them were lifted by screw-type jacks.

Heede holds an exclusive licensing authority for this work in the U. S. from the Swedish engineering firm of A. B. Byggbattring, which controls world patents for the system. And Heede not only designed the forms for the work, but supplied an experienced engineer for the job. Eric Hedeby, formerly of Stockholm, was technical advisor, and during part of the job served as day concrete superintendent for the contractor.

3. Challenge truck mixers deliver concrete for the second section. The material, placed 2 to 4 inches deep, was hand-puddled.



4. A Gar-Bro bucket is being lifted to the top of the second section. Extra jacks under this near side kept the form level and the shaft in alignment.



5. With work completed on the 74-foot-high center section, concreting starts on the two 8 x 7-





Hydraulic jacks lift slip forms to build monolithic bridge piers

**Three forms are used to construct 210-foot shafts;
method is simple, but requires extra care during work**

by RAY DAY

Between December 7, 1955, when the first pier pour was made, and March 10 of this year, when the second 210-foot canyon pier was topped out, 5,600 cubic yards of structural concrete were placed by the contractor. During these 20 weeks, weather was good and the river level varied hardly 12 inches. The system has proved so successful on this job, that an even bigger bridge—involving construction of nearly 50 piers—will be built by the same method, according to Peter Kiewit Sons' Co.

When the new span is completed, it will have an over-all length of 1,310 feet, the main canyon crossing

consisting of a 1,040-foot continuous deck truss with spans of 312, 416, and 312 feet. This will rest on a concrete abutment on the east side of the canyon, on the two 210-foot high intermediate piers, and a 25-foot transition bent on the west side of the gorge. The steel truss will reach a maximum depth of 78 feet over the 210-foot piers.

Care required

Though the jacking system is a simple one, a number of things must be taken into account when it is used, and these make the work seem much more complex than it really is.

The hydraulic setup, requiring only one operator, controls all jacks at once from a control pump. This system, with uninterrupted movement, guarantees a monolithic structure. Both piers built with the method have surfaces with a dense finish, capable of standing up against weathering better than concrete placed in the conventional way. Also, on the credit side, the system not only saved labor and materials costs, but eliminated bulging and surface blemishes from tie-rod cones.

But when it is used, a number of things must be considered in maintaining the alignment of the struc-

ture. High winds or extra loading as concrete is hoisted off one side of the forms, means that more jacks have to be set under points where these loads are concentrated. In most cases, this side of the form is carried slightly higher. On this job, buckets were hoisted to the top of the pier from a point beyond the center of gravity, and two additional jacks were required under this side of the form to keep its edge about a half inch higher than the edge opposite the hoisting A-frame.

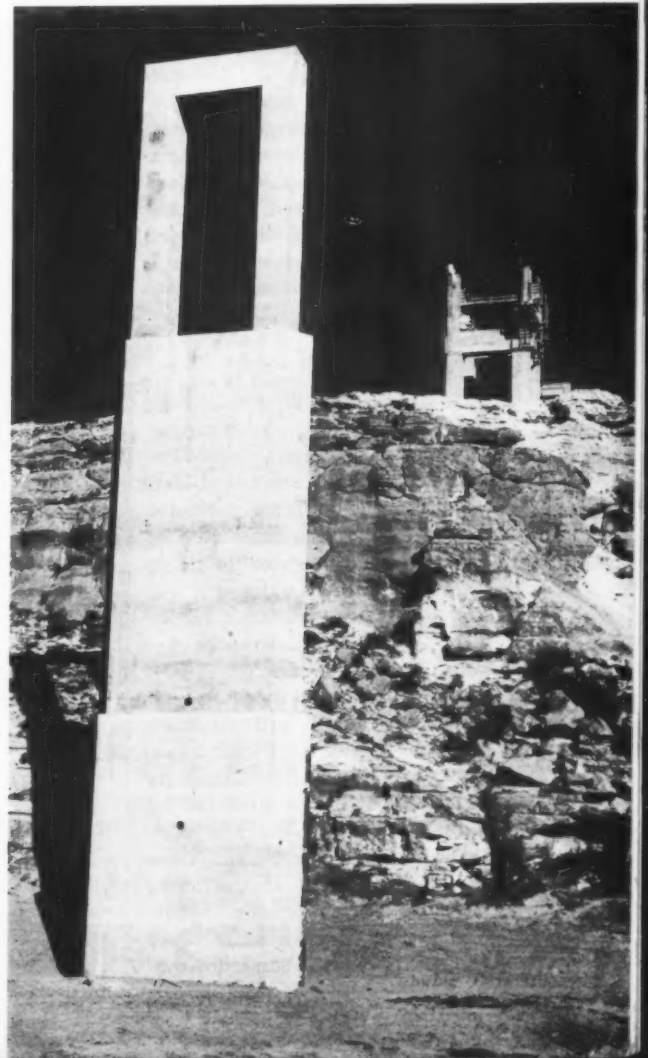
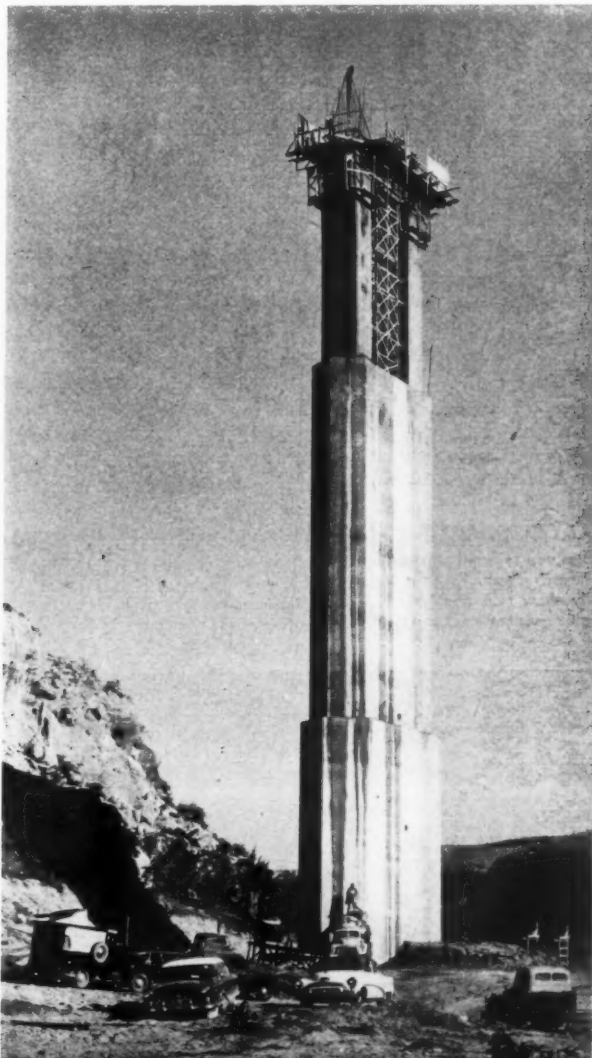
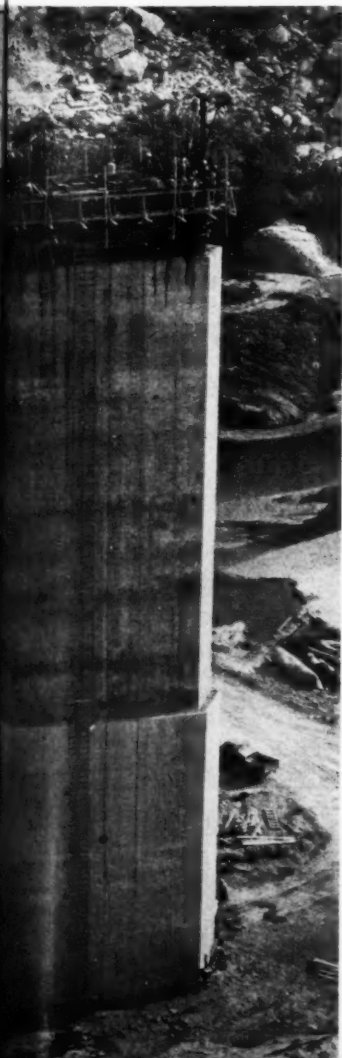
Sectionalized piers

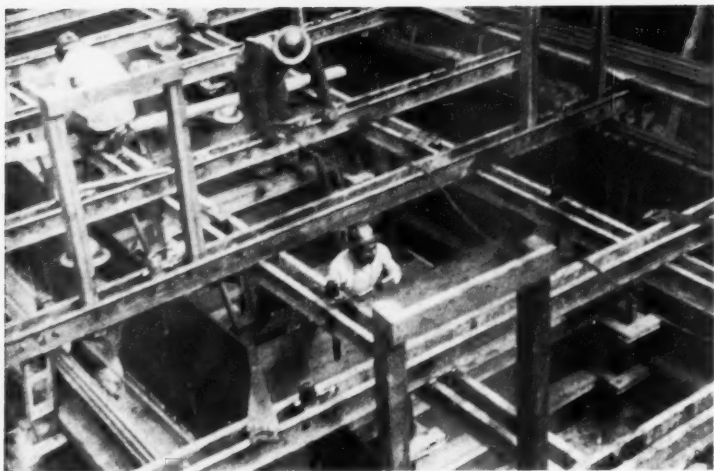
The two piers built with the slip-

foot rectangular concrete columns that top the shaft. Six jacks were used on each column to lift forms.

6. As work nears the top of the pier, 4 x 4 timber bracing is set from the middle section to the underside of the 8 x 8-foot cap.

7. One of the 210-foot piers that will support the Pecos River bridge stands completed, while work continues on transition bent No. 4.





Two lines of double 50-foot-long channels, placed at right angles to the highway center line, and eight lines of channels 19 feet long, parallel to the center line, form a rigid framework that supports the form as it moves upward.

form method were designed in three sections by the bridge department of the Texas State Highway Department. The bottom section of each pier, bedded 6 feet deep in solid limestone, was pointed both upstream and downstream to minimize hydraulic resistance to flows. The upstream section also has a steel noseplate to guard the pier against flood debris. This bottom section, 70 feet high, 44 feet long, 15 feet wide, and containing 1,016 cubic yards of concrete, contains three 8×9-foot hollow cells with 3-foot minimum walls and a 6-foot-deep concrete cap.

The middle section of each pier contains 700 cubic yards of concrete and is 74 feet high, 40 feet long, and 12 feet wide. It has three 8×8-foot hollow cells with 2-foot minimum walls in a 6-foot-deep cap. Though smaller than the bottom portion, the middle section is similar to it in cross section.

The top section, containing 292 cubic yards of concrete consists simply of two 8×7-foot rectangular concrete columns, 52 feet high and spaced about 18 feet apart. These two concrete legs are topped by an 8×8-foot concrete cap 32 feet wide.

The slip-form system functioned so well that only a 24-hour cold joint at the base of this upper cap was needed during the pouring of all three sections.

Built in three sections

The slip forms used to erect each pier were built in three sections. The bottom section, used to construct the base portion of each pier, had ¾-inch plywood facing, 48-inches high, for both the outside and inside walls of the hollow cells. Plywood facing of the same thickness and height was also used to form the outer surface of the pier. Outside and inside plywood faces were battered out ½-inch at the bottom so that they would not stick as they slipped up the hardened concrete.

This bottom section used three-ply 2×6 wales, 12 inches below the top of the form, and two-ply, 2×6 wales, 12 inches above the bottom. There were 2×4 verticals at the lifting points and at other bracing.

The strong, rigid system necessary to hold these forms suspended con-

sisted of 6-inch steel channels. There were two lines of double channels, 50 feet long, which were placed at right angles to the highway center line. Eight lines of the same type of channels, 19 feet long, were laid parallel to the highway center line. Double channels, spaced 4 inches apart, accommodated the hydraulic jacks, and the steel yokes in which the forms were suspended.

The long channels were spaced so that they rested on the shorter channels, and the joint was welded. Channel spacing was so arranged that the load was distributed evenly to all forms. The jacking system compensated for any uneven movement.

A steel yoke was used wherever channels extended over the outside and inside forms. This yoke was

attached to the bottom of a two-ply wale, which was, in turn, held in place by a wooden bracket nailed to the top of a three-ply wale. The 24 hydraulic jacks, uniformly spaced between the double channels, were located in the center of the outside walls, in the inside cell walls, and in the pointed nose and tail sections of the pier. Since the concrete was placed in the bottom section by a Koehring 605 crawler crane, the two extra jacks needed to compensate for load drift on the upper sections were not required.

A walkway with a safety railing was located outside the forms on top of the channels. Also, the inside cells were covered with heavy timbers that rested on the channels to form a work platform for the placement of steel

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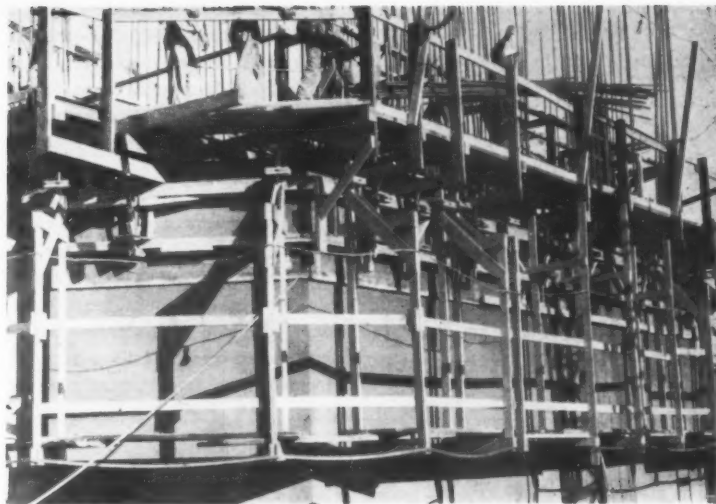
TEXACO

CONTRACTORS AND ENGINEERS

and the pouring of concrete.

The 1-inch mild-steel jacking rods, used by the hydraulic jacks in their climb to the top of the pier, came in sections 12 feet long. These were screwed together, pushed through the hydraulic jack, and set either on the concrete footing or on the cap of a previous pour. To keep concrete from adhering to the jack rods, and to permit jacking rods to be recovered after the concrete was finished, a thin recovery pipe, slightly more than 1 inch in diameter and 4 feet long, was used. This pipe was screwed to the bottom of each hydraulic jack. As the pipe moved up through the concrete, it left a hardened surface near the bottom, so that jacking rods could be salvaged after concrete work had been completed. All jacks

Attached to the outside walls of the shaft was the finishing and curing scaffold. One man finished the concrete as soon as the form cleared a given point and water cure was applied by a second man.



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were connected to the central pump with small high-pressure tubing, with the tubing system tied in turn to a hydraulic pump powered by a 1½-hp electric motor.

A concrete finishing scaffold was attached to the outside wales, so that as soon as the form cleared a given point, the surface could be finished by one man. The finisher scaffold was also used as a curing platform, a water cure being sprayed by garden hoses fed by a 2-inch delivery pipe carried up with the slipform. A scaffold inside the cells was used for inspection and repair purposes. Wood brackets between the channel steel guided vertical reinforcing steel as the pour progressed. Reinforcing steel was also welded to the channels just above the walls, and exactly on the line of reinforcing steel, so that reinforcing steel could not creep too close to the face of the concrete piers.

Middle and top sections

Though the middle section had a smaller over-all dimension, it was made the same as the bottom section. To overcome the tendency of the pier to run off line because of the weight of concrete here being hoisted, two additional hydraulic jacks were placed under the end in which the concrete boom and hoist was used.

The top section slip form was used to construct two rectangular columns on the pier. Six hydraulic jacks were used for each column form, and two additional jacks were used in the end carrying the boom. Six other hydraulic jacks were used in the space between columns.

For this lift, the jack rods were attached to 4×4's with J-bolts, and the 4×4's were laced together with smaller cross bracing and anchored against the concrete columns with 2×6's. This system of 4×4 bracing extended from the top of the cap on the middle section to the underside of the cap on the top section. The purpose of these timbers was to guide the jacking rods, and provide some support for the top cap that was to be placed. The main weight of this cap rested on 12-inch I-beams placed between the columns when the bottom elevation of the upper cap had been reached, and was supported

(Continued on next page)



Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 352

(Continued from preceding page)

on an angle iron bolted to columns.

Steel laps staggered

Steel bars up to and including No. 11 in size were used to reinforce the piers, and the laps of this steel were staggered. The problem of how to keep up with splices while the slip form was rising was taken care of by starting the bottom lift with steel in 2-foot increments, ranging from 10 to 20 feet long. This was lap-welded to the footing dowels or the cap on

the previous pour. All vertical splices were electrically welded as the pour went on. It was not too hard to keep abreast of this work, since only 20 per cent of the splices had to be made at one time. To insure that horizontal steel would be placed accurately as soon as the bottom channels cleared an area, marks were made on the vertical steel at horizontal bar locations so that it was not necessary to make a measurement from a steel bar embedded in concrete. Ventilation holes for the hollow pier cells, formed with metal, were placed in

the slip form at the proper location.

Before a pour started, forms were set level. This was done by pumping each jack individually until it was in line with a hacksaw mark made on each jack rod. Concrete for this section was delivered in two Challenge truck mixers, then lifted to the top of the slip form by a Koehring 605 crane. In three to four hours, when the first 15 to 18-inch layer of concrete had hardened, the jacks started moving the form upward, and this continued until each section of the pier had been finished.

The one man operating the jacking system began hoisting the form by closing a valve on the central pump, then turning the motor oil to force light oil into each jack. During the lifting cycle, a pressure gage registered 50 pounds. When it reached more than 100 pounds, the pump was shut off as it showed that the jacking cycle had been completed. On an average, a 1-inch cycle took only 1½ minutes. The time between raises varied, since the rate at which concrete set up depended on whether a pour was made during windy weather or during the day or night. After the job started, mixing water was heated to a temperature of 150 degrees and set-up time for the concrete was reduced about 20 per cent. The best rate of placement came to 11 inches per hour; the lowest rate was 5 inches per hour.

Unusual concrete placement

Concrete was placed in layers from 2 to 4 inches deep and hand-puddled, since vibrators would have tended to disturb concrete underneath and might even have caused a breakout under the forms. The use of quick-setting accelerators was also ruled out. Concrete with a slump of 3 to 4 inches worked better than a drier mix, and it provided a much better finish. Excess water seeped down the sides of the pier, making it easier for the slip form to move upward.

The concrete, a Class A 5-sack mix, was weighed and proportioned at the Pecos River Bridge site by a batch plant charged by an Insley crane with an Owen clam bucket. Concrete materials were furnished by Beauchamp-Rhodes, Del Rio, Texas, which hauled aggregate and sand from the Rio Grande River. Longhorn cement was used exclusively.

As soon as finishing had been done by one man, concrete was cured, one process being discarded before a method of curing was finally adopted. At first, perforated garden hose, circling the pier, was suspended from the slip form. But alkali in the Pecos River water clogged some of the holes, and all the pressure of the water was concentrated in a few spots. The water from these few holes failed to cover all the concrete, and the force of the water cut small grooves into the pier. The system was quickly discarded, and a tank truck was used to keep the standpipe supplied with water that was pumped up to the finishing platform. Here, a workman with a garden hose used a fine spray to keep the concrete wet.

Top pour

As soon as the two lower sections of a pier had been completed, the inside cell forms had to be pinned off. This was done with ⅝ × 18-inch sharpened steel pins driven through the forms into the fresh concrete just beneath the wales. After four pins had been driven in each side of the pier, the steel yokes were removed and the forms released from the channels.

Heavy timber joists nailed to 3-ply wales and formed with plywood were used to form the bottom of the

New DW21 makes 15 round trips per hour on 1200-foot round-trip haul in Montana



On Tenth Avenue, South, in Great Falls, S. Birch & Sons Construction Co. is rebuilding four miles of bypass connecting U. S. Highways 87, 89 and 91. The \$454,000 contract calls for widening the route from two lanes to four lanes, divided. Completion of the one-year project is scheduled for August, 1956.

A CAT* DW21 Tractor (Series C) with a No. 470 LOWBOWL Scraper is shown here loading material from the old road surface. It makes 15 round trips per hour over a haul distance of 200 yards each way. The rig has done 90% of the earthmoving on this job, according to C. F. Graves, foreman. He says: "It's the best piece of rubber-tired equipment I ever saw. It does a good job of ripping up the old oil surface, and in dirt it can do a pretty good job of loading itself."

Guy Haney, the superintendent, adds: "Our new DW21 is a honey. It has fine power and traction and the No. 470 definitely loads much easier than any other scraper we ever used."

Wherever these new units are in action, that's the kind of reports that come in. The DW21 (Series C), with its 300 HP (maximum output) Turbocharged engine, is perfectly matched with the No. 470 LOWBOWL Scraper. The lower, wider bowl design loads more earth faster and with less effort. That means consistently better cycle times and bigger production.

If you haven't seen the DW21-No. 470 unit at work, ask your Caterpillar Dealer for a demonstration right on your job. Hold a stop watch on it and prove for yourself that it will outwork any comparable wheeled rig.

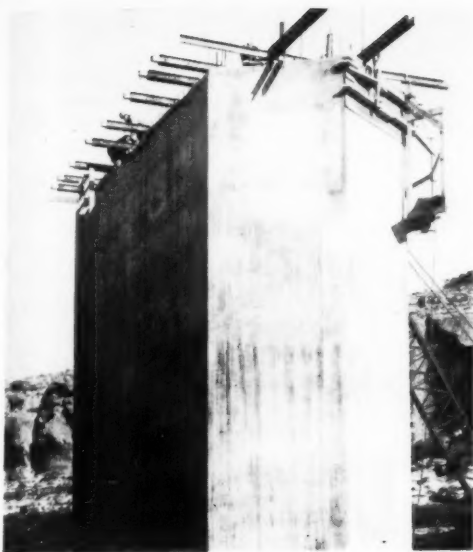
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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YOUR DEALER
WILL DEMONSTRATE**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 353



After some 1,016 yards of concrete has been placed for the bottom 44 x 15 x 70-foot section, the first form is dismantled. Finishing and curing were done as the form moved upward.

faster, simpler and even less expensive than it already is.

Personnel

The Pecos River bridge was designed under the general supervision of D. C. Greer, state highway engineer of the Texas State Highway Department, with Randle B. Alexander as bridge engineer. M. B. Hodges, district engineer at Del Rio, Texas, represents state supervision at that level. G. P. Brown is senior resident engineer, and Grover L. Sprott is chief inspector.

The contractor had Jack Nicar as general superintendent, assisted by Carl Shields on concrete and forming work. C. M. Davis, consulting engineer of Fort Worth, Texas, was consultant on the forms. **THE END**

Data on engineer shortage

Carnegie Institute of Technology has released information on the current shortage of engineers, based on questionnaires sent to approximately 18,000 alumni of the school.

From the 95 per cent of the questionnaires returned, Carnegie reported that many graduate engineers are working at other professions, including medicine, editing, sales, law, and politics. More than 329 graduates were corporation or company presidents, 357 were vice presidents, and 349 were general managers. In all, 1,240 distinct occupations were reported.

Only one-fourth of those interviewed, or 2,391 graduates, listed their occupation as engineer.

cap. These forms were left in place as the cap was poured. A construction joint was not located at this point, since the cell forms could be released and the support work installed in an hour or two. The pour continued until the slip form was about six inches above the top of the cap grade. Chamfer strips were then nailed to exact cap grade inside the form, and concrete was placed to the top of these strips. This marked the top elevation of the middle pier section.

Both the rectangular column legs of the upper, or third section of the pier were poured simultaneously. One construction joint was made at the bottom cap level for this section. When work reached this point, bolts were placed in the concrete which was left for about 24 hours to set up. These bolts held heavy angle iron to the inside of each reinforced-concrete column when the forms had been removed. Seven 12-inch steel I-beams, laid crosswise, were welded to the angle iron and floored with plywood. The I-beams, together with the 4x4 bracing underneath, supported the heavy cap after piers reached their final elevation.

All during the time concrete was being placed, three transits were used—one on each side of the pier and one along the center line—so that checks on the alignment of the piers could be made round-the-clock at three hour intervals. Checks were made by taking a foresight on a known permanent target, and checking targets that had been painted on the forms. The maximum drift off alignment was 3/4-inch during the course of the job. In about 90 per cent of the pier elevation, the alignment is within 1/16-inch.

Though the use of these slip forms on this project has been successful on this job, according to project officials, job engineers feel that one major design change should be considered if this type of pier construction is given as an alternate to conventional types. The change would be required particularly for hoop reinforcing, because it is impossible to place this type of reinforcing without cutting and splicing horizontal bars. If straight bars, or bars with short hoops were designed, these men say, slip form pier construction would be



Tough Digging in Confined Areas

Eimco 105 Tractor Excavators can work efficiently in small areas because of their built in features.



These features permit the Eimco 105 to work in many places such as narrow ditch digging, tunnels, water channels, mines, railroad cuts, highway widening jobs and numerous others including basement excavation as shown above.

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necessity of turning to discharge the bucket, (4) Simple easy controls, two small handles are all that control the motion of the tractor. Push for forward motion and pull for reverse motion.

Eimco 105 Tractor-Excavators are being used on construction jobs all over the world as well as in mines and quarries. These machines are operating longer periods at lower cost per yard loaded than any other equipment.

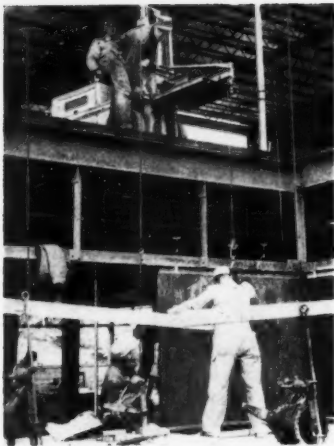
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 354



A workman turns the winch handle and lowers the slab into position for setting by the masons. The contractor said this method cut setting costs by 50 per cent.

Case history

Fork-lift-mounted winch places 1,000-pound slabs

A time-saving solution to the problem of handling and positioning 1/2-ton granite slabs to be used as building facing has been devised by J. P. Cullen & Son, Janesville, Wis. The Cullen firm devised the method while building a \$1.5 million, four-floor courthouse in Janesville.

"This method . . . cut our (slab) setting cost as much as 50 per cent," reports Mark Cullen, a partner in the contracting firm.

The Cullen organization mounted a hand-operated winch on a Clark Yardlift pneumatic-tire fork truck. The winch was welded to a steel pal-

Close-up of winch and Clark fork-truck rig shows how the winch is welded to a steel pallet which has channels on the underside for a fork insertion. Clamp-on hook grips the granite slabs.



let with channels on the underside. The Yardlift's forks fitted into the channels and the winch was secured to the material-handling rig by means of an angle iron that ran from the head of the winch to the Yardlift's fork-plate, where it was bolted to a clip welded on the top of the plate.

The slabs were stockpiled at the construction site in tiers, each slab separated from the next by a pallet or a pair of 4 x 4's. As the masons called for a slab, it was lifted by the Yardlift and deposited on the building hoist, which raised it to the floor above the one on which it was needed. There, another fork-lift removed it from the hoist.

The second fork truck then picked up the steel-pallet-mounted winch and the angle iron was bolted in place to secure the rig. A special setting clamp on the end of the winch cable was fastened to the slab and the forks were raised until the slab dangled clear of the deck. The Yardlift moved to the edge of the deck over the spot where the masons wanted to set the slab.

By first lowering the forks and then cranking the winch a few turns, the slab was lowered into place. The only manual labor involved turning the winch handle and an occasional nudge to guide the slab home.

When not working with the slabs, Cullen's pair of Clark fork-lifts handled palletized face brick, partition tile, concrete blocks, and steel mortar boxes. The second machine was moved from floor to floor on the building hoist.

For further information about Clark fork trucks write to the Clark Equipment Co., Industrial Truck Division, Battle Creek, Mich., or use the Request Card at page 18. Circle No. 186.

Equipment film

The Buck Equipment Corp., Cincinnati, Ohio, has released a 16-mm sound-color film covering the applications of the Buck hoisting machine. Entitled "The Buck Hoisting Machine", the film shows many on-the-job photos of the unit in all its models.

Available on a loan basis, the film may be obtained from the Buck Equipment Corp., 720 Anderson Ferry Road, Cincinnati 38, Ohio.

CONTRACTORS AND ENGINEERS



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BUT WHEN IT
COMES TO BUILDING
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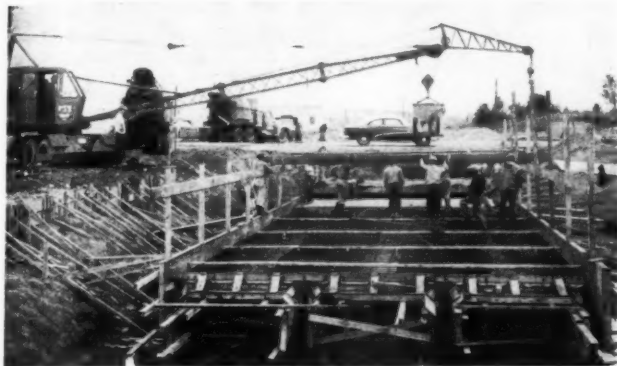
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 355

A Bantam T-35 truck crane with a 1/2-yard bucket handles concrete for Hugh Connor, Inc., doing a barrel-culvert job at Dow Air Force Base, and cuts costs \$1.50 per yard over the chute method.



Case history

Truck crane cuts costs on barrel-culvert pours

Using a Bantam T-35 7-ton truck crane with a 1/2-yard concrete bucket, Hugh Connor, Inc., Bangor, Maine, cut costs \$1.50 per yard over its previous method of pouring barrel culverts at Dow Air Force Base. The Bantam cut in half the manpower needed for the job.

Previously, the Connor organization dumped the concrete from ready-mix trucks into chutes running into the culverts. Twelve men were used to shovel and place the concrete in the forms. With the truck crane on the job, the manpower was reduced to six and the need for moving and rebuilding the chute was eliminated.

Contractor Connor also uses Bantams on basement-pouring jobs. He reports pouring 150 cubic yards of concrete into narrow forms in only eight hours. When it's needed, a 10-foot extension can be added to the crane boom in 20 minutes.

Connor points out that he can own two Bantams for approximately the same price as one larger rig equaling their combined lifting capacity. When he has heavy lifting to do, he just teams up his Bantams.

For more information on the Bantam T-35 truck crane write to the Schield Bantam Co., Waverly, Iowa, or use the Request Card at page 18. Circle No. 184.

New chart gives data on hoist classifications

A new Hoist Classification Rating Chart has been released by the Truck Body & Equipment Association, Inc. The chart places hoists made by members of the association into classes depending on the torque rating in inch-pounds developed by the hoist around its hinge shaft. A table for determining the size of rating of hoist needed for any anticipated use is also included.

A glossary of terms, intended for use as a standard reference, accompanies the chart.

Prepared by the engineering committee of the TBEA, the chart is available from the Executive Offices of the Truck Body & Equipment Association, Inc., 403 Washington Board of Trade Bldg., 1616 K St. N. W., Washington 6, D. C.

Four new HRB books

Four new bulletins from the Highway Research Board, "Land Acquisition 1955", "Design and Testing of Flexible Pavement", "Vertical Sand Drains for Stabilization of Embankments", and "Experimental Concrete Pavements", Bulletins 113, 114, 115, and 116, respectively, contain papers and reports presented at the board's 34th annual meeting in January, 1955.

"Land Acquisition" summarizes developments in the fields of control of highway access and adjacent lands, roadside regulation, and right-of-way problems. The bulletin is priced at \$1.80.

Bulletin 114, "Design and Testing of Flexible Pavement", discusses wheel-load stress; design, construc-

tion, and evaluation of heavy-duty runways; flexible pavement deflections and fatigue failures. Charts, diagrams, and photographs illustrate the test. The bulletin costs \$1.65.

"Vertical Sand Drains for Stabilization of Embankments" points out the progress made in the development and installation of vertical sand drains. It is priced at ninety cents.

Bulletin 116, "Experimental Concrete Pavements" observes the factors affecting pavement performance and reports on the performance of various thicknesses of subbases under portland-cement concrete pavement. The bulletin is priced at \$1.35.

All books are available from the Highway Research Correlation Service, Highway Research Board, 2101 Constitution Ave., Washington, D. C.

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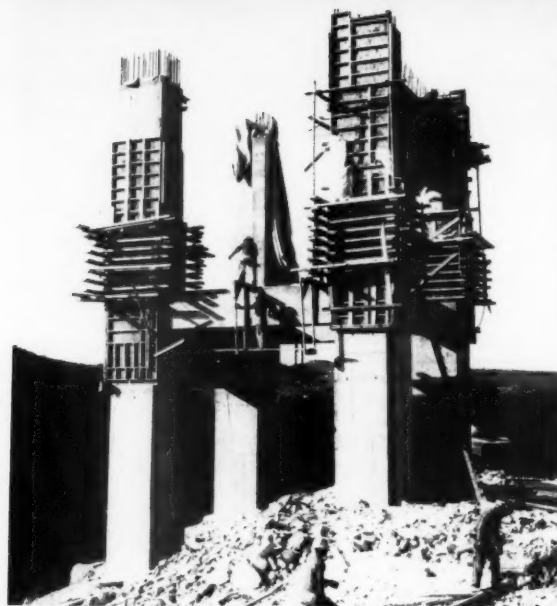
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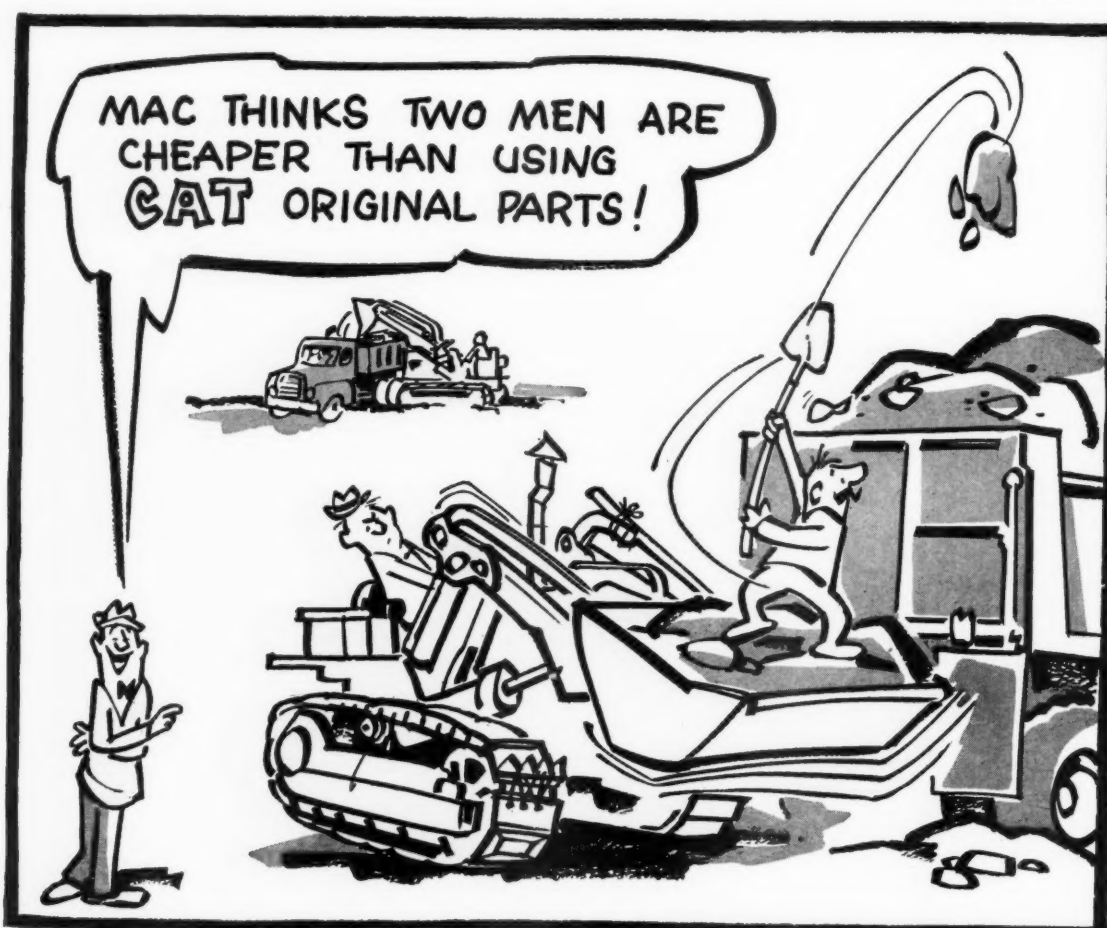
For more facts, use Reader-Reply Card opposite page 18 and circle No. 356



Form system cuts work on odd-shaped bridge piers



Conventional plywood forms are used on transition bent No. 4 for the Pecos River bridge. Standard size panels cut from 8-foot-long plywood made it easy for men to complete forming for the land-based piers.



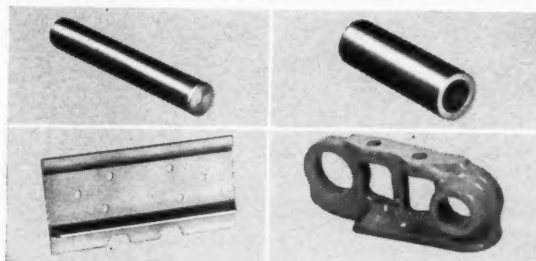
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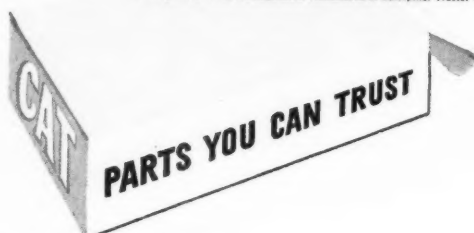
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Aside from the unusual slip-forming method used to build the 210-foot high piers of the Pecos River Bridge, (see page 6) the contractor, Whittle Contracting Co., Dallas, Texas, has gone in for some time and cost-saving techniques to construct the land-based concrete piers.

The forming system used, developed over a period of years by Carl Shields, carpenter and concrete superintendent on this project, is similar though not identical to several patented form arrangements now on the market. Whittle is using various sizes of plywood panels, all formed from 8-foot long panels, to construct a form for the pours. These panels provide enough flexibility to make the job most efficient, since forming for the land-based bents for the span is not identical. And these prefabricated forms are being held by collars made from heavy timber that will be re-used to support the overhanging forms for the two-foot sidewalks of the bridge.

Forming for land piers

The efficient forming system was used on the first abutment, the transition bent, bent 5, and abutment 6. The system involves taking prefabricated 8-foot-long plywood panels, and cutting them to make 4x8, 3x8, 2x8, and 1x8 panels. These are drilled on 1x2-foot centers in the plywood. A 2x4 plate around each panel is also drilled at 1-foot intervals so that two panels can be joined to make a form for almost any size pour. The plywood facing is backed at 16-inch intervals by 2x4 studs fastened to the 2x4 plate.

Even though the transition bent—a four-legged unit with eight ties—is of an odd dimension, it was built with about 99 per cent of the concrete being enclosed in the plywood forms. The remaining portion of the form was field fabricated and nailed to the top of the panel forms. This 25-foot transition bent, consisting of a slab span on four rectangular columns, separates the continuous deck truss from 240 feet of continuous plate girder construction. The latter actually consists of two 120-foot spans.

When the rectangular bent legs were poured, the prefabricated form

CONTRACTORS AND ENGINEERS

Various size panels are made from 8-foot plywood sheets; bridge approach calls for 43-foot-deep cut in limestone

A Mayhew rotary drill, mounted on a Ford F-8 truck, uses a Varel bit to sink a 25-foot powder hole into solid rock for the 43-foot deep cut needed for the bridge approach. About 30 minutes was required for each hole.



sections were enclosed with 3x10 timber collars held by steel bolts. While collars of this size are heavy for this type of construction, the contractor used them since timber of this size was needed later to support the overhanging forms for the 2-foot sidewalk on the bridge deck. In this way, the contractor is saving some money by having the timbers do double duty.

Concrete construction for the piers was similar to work on the bottom section of the 210-foot-high piers in the gorge. The only difference was that Viber machines consolidated the concrete once it had been placed for the land-base piers. Hand-puddling was required on the taller shafts, since the use of vibrators might have caused concrete underneath to break out. On this project, a batch plant supplied concrete to Challenge truck mixers hauling to the field. A Koehring 304 brought concrete to the forms in a Gar-Bro 1-yard concrete bucket.

Cut in solid rock

While Whittle Contracting Co. is doing the major share of work on the bridge, under a \$1,269,268.75 contract with the Texas State Highway Department, specialty contracts were sublet for specialty work. In addition to the B. M. Heede contract in connection with the 210-foot-high piers in the gorge, there was a subcontract for furnishing and erecting the steel truss, which went to American Bridge Co. This work will be done this summer. Excavation of rock for the approach cuts was sublet to Condon & Cunningham, Dallas, which made a drilling arrangement with Walters Drilling Co., Inc., Dallas, for rotary drilling of the blast holes needed in the cuts.

One cut went to a depth of 43 feet in solid rock, so that the highway could be brought to the bridge on a new, straight alignment. The solid limestone in this area was drilled to a maximum depth of 25 feet by a Mayhew rotary drill mounted on a Ford F-8 truck. Auxiliary equipment on this machine included a Gardner-Denver vertical air compressor and Varel rock bits. The Varel bit is a three-legged, roller-type cutting tool.

(Continued on next page)

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GYRO-FLO Compressors and I-R Wagon Drills on a thruway construction job. More compressors and drills on another section of same highway are shown below.

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As one Euclid end-dump is loaded with broken rock, another pulls into place on the other side of the shovel to wait its turn to be loaded.

(Continued from preceding page)

capable of bottoming at a 4-inch diameter in limestone. Holes were on 15-foot centers and 12 feet back from the face at the start.

A 25-foot-deep hole was put down in about 30 minutes. After about four rows were drilled across the area to be cut, the holes were loaded to about three feet from the surface with Hercules Hercomite B in 3½ × 16-inch cartridges. Charges increased progressively until the inner row was reached, the lightest charge being placed in the row nearest the face. The heavier charge in the last row kicked the rock out to one side so that a vertical face, completely in the clear, resulted. The Hercules fast delays used tended to break the solid limestone so that it formed a neat, well broken muck pile.

The chief difficulty during drilling and blasting was caused by the fissures and small caves in the formation. Even suspending heavy charges of dynamite inside the caves did little to make the job easier, and secondary drilling had to be done with jackhammers. Condon & Cunningham used a Northwest 80-D to load the Euclid end-dumps making the ¼-mile haul to waste the rock in a gorge. Excavation for the west side cut was done in a similar manner, although this cut was not as deep.

Replaces temporary crossing

A new bridge, such as the one under construction, had been planned for this site by the Texas State Highway Department for a number of years, but cost considerations held up the work until the summer of 1954. Until that time, U. S. 90 had been carried across the river on a 45-foot steel truss span with a concrete deck that was located high above the then-known high-water marks. But in June, 1954, a flood roared down the river, and the hydraulic force, combined with floating trees and debris in the 86 feet of water, completely destroyed the bridge. Traffic was halted for 57 days until the river subsided and a low water crossing was built.

This bridge served until July, 1955, when the Pecos again went on a rampage, tearing the bridge out. Again, traffic was stopped for 16 days until the bridge was rebuilt.

The highway department began design and location studies for the new span immediately after the flood in 1954. These studies were for a bridge that would span the 300-foot-deep gorge from rim to rim, so that the deck would be far above the high water mark and the steep and winding sections of U. S. 90, that dropped into the gorge on one side and climbed out on the other, would be eliminated. By January 1, 1957, when the new bridge is completed just upstream from the former high-level crossing, the problem of washed-out bridges at this site should be a thing of the past.

THE END



Case history

Masking tape solution to air-seepage problem

A problem that is always present in placing acoustical-tile ceilings spaced away from the floor above, to provide a chamber for air ducts, is how to prevent the seepage of air and dust from the chamber and the resulting discoloration of the tile edges. A simple, economical solution worked out for the Travelers Insurance Co. building in Hartford, Conn., involves the use of a flatback masking tape.

The tape is placed over the joints

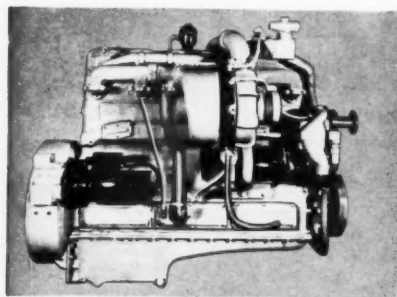
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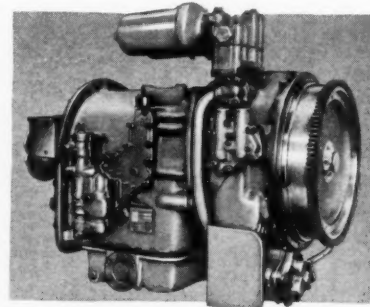
Hundreds of contractors, mine owners, quarry operators, and other equipment users told our engineers what they needed in an off-highway hauler. Their suggested design features have been carefully built into the new International Payhaulers. In these rugged, all-new, rear-dump haulers, you have greater horsepower-to-payload weight ratios than are available in most other off-highway trucks. You have stronger main frames to carry bigger payloads with rugged dependability. You have higher hauling speeds . . . full-power hoists for faster dumping . . . better all-around visibility.

These features are the result of rigorous, field testing. Payhaulers have worked on many contracting, mine, quarry, and similar jobs. Others have run "round-the-clock" at our proving grounds. Others have undergone painstaking laboratory research. Now all this testing is completed and the Payhaulers are ready to roll. You owe it to yourself to check their features. Our test users did—and, as proof of outstanding Payhauler performance, a great many have placed their orders. Compare Payhaulers with your present hauling units to see what profit-making features you will get.



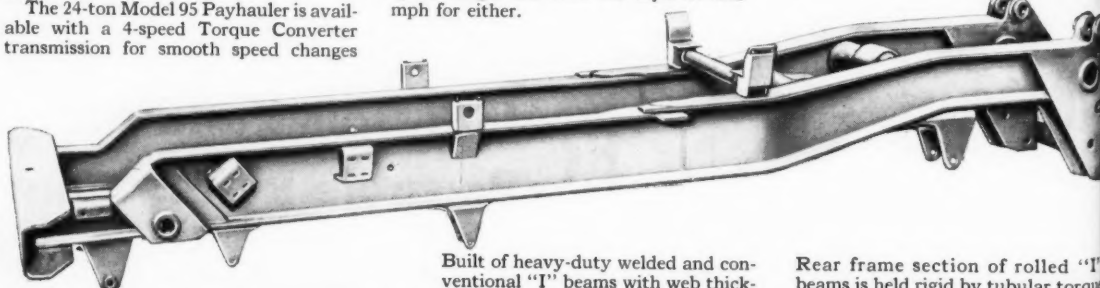
TURBO-CHARGED DIESEL ENGINES—CHOICE OF TRANSMISSIONS—Both the "65" and "95" Payhaulers have more horsepower per truck yard than any other truck in their size classes. The 24-ton, 16-yard "95" is powered by a 335 hp diesel...the 18-ton, 12-yard "65" is powered by 250 hp. Turbo-charging keeps power high, weight low, reduces fuel consumption 10% or more.

The 24-ton Model 95 Payhauler is available with a 4-speed Torque Converter transmission for smooth speed changes



from 4.8 to 38 mph. A lock-up clutch for direct drive performance and a Torqmatic brake system are standard with the Torqmatic transmission. Also available for the "95" Payhauler is a 9-speed transmission which provides an excellent range of speeds from 2.6 to 37.2.

In the Model 65 Payhauler you have a choice of a 5 or 10-speed transmission—speed ranges are from 3.5 mph to 36.5 mph for either.



RUGGED, ALL-WELDED FRAME STRONGEST AVAILABLE—

Built of heavy-duty welded and conventional "I" beams with web thicknesses of ½ and ¾ inches, Payhauler main frames have the strongest known section modulus of any off-highway truck.

Rear frame section of rolled "I" beams is held rigid by tubular torque and hoist mounting members. Front frame members flex with shock loads through channel bumper torque member.

of the plasterboard strips to which the acoustical tile is glued. The plasterboard was nailed to nail-lock channels suspended 18 inches below the upper floor deck, providing sufficient room for the network of air ducts.

One method that had been used called for pressing into the plasterboard joints the mastic used to glue the tiles. Not only was this a slow procedure, but there was the danger of the mastic cracking after it hardened, thereby allowing air holes to develop.

Another method involved taping the joints with spackle (liquid gypsum or plaster) and an uncoated, perforated



Masking tape was applied to all plasterboard joints in the ceiling of the new Travelers Insurance Co. building, Hartford, Conn., to seal the air chamber above. Openings around pipes or fixtures, as well as the seam where the plasterboard butts the wall boards, were taped.

paper tape. Though this method brought satisfactory results, it was more expensive than flatback tape in both materials and labor.

All plasterboard joints in the Travelers building, as well as openings around fixtures, were sealed with Behr-cat No. 121 flatback masking tape, 1½ inches wide. The tape is a pressure-sensitive flat paper tape, and provides over-all contact with the plasterboard.

For further information on the tape write to Behr-Manning Division of the Norton Co., Troy, N. Y., or use the Request Card at page 18. Circle No. 196.

New concrete finisher works down high spots

■ A new four-blade concrete finisher featuring adjustable pitch blades is announced by the Superior Cement Tool Co. The adjustability of the blade pitch during the finishing is



The blades on the Superior cement finisher do not adapt themselves to uneven surfaces; thus it works down high spots and produces a level surface.

said to compensate for all the various surface conditions encountered, and to eliminate blade changing.

According to the manufacturer, the four-blade finisher does not adapt itself to uneven surfaces; thus it works down the high spots and produces a truer level finish. It is not uncommon for Superior finishers to increase output, according to the company, by more than 50 per cent over ordinary machines.

Other features include a sealed and lifetime-lubricated gear box, Timken main bearings, a 2-hp air-cooled engine, a stationary guard ring, cast steel tangential arm braces, and a mercury safety switch.

For further information write to the Superior Cement Tool Co., 11616 Wright Road, Lynwood, Calif., or use the Request Card at page 18. Circle No. 101.

Diesel exhaust brake assists regular system

■ A new exhaust brake announced by Mack Trucks, Inc., as standard optional equipment is said to increase engine retardation by more than 50 per cent to add to diesel-truck safety and reduce wear on brakes. By means of a butterfly valve in the exhaust line, back pressure is created to transform the engine into an air compressor, thus augmenting full engine braking.

An over-riding switch actuated by the fuel-injection pump permits the exhaust brake to function only when injection ceases, so that nothing but pure air is trapped by the butterfly valve.

Power to operate the valve is supplied by an air cylinder connected with the regular air-brake system, a magnet valve controlling the admission and exhaust of air.

For further information write to Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y., or use the Request Card that is bound in at page 18. Circle No. 114.

←For more facts, circle No. 359

Payhaulers®



ALL WELDED ROCK-RUGGED BODIES—The Model 95 Payhauler shown is equipped with heated body. Quarry bodies available for both the Model 65 and 95 Payhaulers.



INTERNATIONAL® Construction Equipment

International Harvester Company, 190 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Booms . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks



1 A Caterpillar motor grader with a drop plate welded to the center of the blade cuts a 2½-foot-wide 7-inch-deep trench for the widening strip.

C&E Staff Photos



2 Ready-mix concrete is poured to the belt conveyor of the Apsco spreader, which delivers it to the Blaw-Knox widener. The plate at front of the widener prevents concrete from sloughing.



3 Another plate at the outside edge of the widener also prevents loss of concrete. The conveyor belt is positioned to reach halfway over the 2-foot trench.

Fast spreader-attached rig widens road without forms

Adjustable widener uses slip-form extension to support concrete until backfill is placed

Fast and efficient paving of 2-foot-wide concrete strips on either side of Route 25A near Rocky Point, Long Island, N. Y., was due to the work of a newly adapted road widener, designed to be attached to a spreading machine, that eliminated the use of formwork.

This rig is capable of handling 6-foot widths of concrete at the rate of 150 tons per hour, and it produces a surface finish acceptable in most states. Both the Blaw-Knox widener, adjustable to handle widths up to 6 feet and depths up to 13 inches, and the Apsco spreading machine are manufactured by Blaw-Knox at the

Apsco plant in Elyria, Ohio.

On this 5-mile project, the machine widened both sides of a 20-foot concrete roadway, bringing it to 24 feet in width. The \$500,000 contract, handled by Lizza & Sons, Inc., Oyster Bay, Long Island, also included the placing of an asphaltic concrete surface on the widened road.

Widener is adjustable

Concrete delivered in ready-mix trucks was transferred by the truck chutes to an adjustable 24-inch-wide rubber belt conveyor on the spreader. This belt is adjusted so that the concrete mix drops off the edge into the



everybody likes a
DRY BOTTOM

GRIFFIN WELLPOINT CORPORATION

881 East 141st St., New York 54, N. Y.

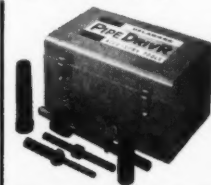
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 360



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And much of the know-how is in using DELAWARE **PIPEDRIVER** tools. DELAWARE has engineered and field tested a complete set of accessory tools for every pipe driving operation. No more need to use costly makeshift tools. No threaded parts to jam, no pins to shear off . . . mill wrap is fully protected against stripping. Made from DELSTEEL ALLOY, the DELAWARE **PIPEDRIVER** tools are designed to take the toughest service. Big savings in time and cost are yours with dependable DELAWARE tools.



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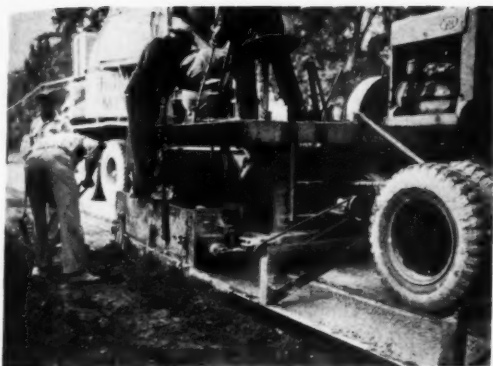
Paving Breaker and Clay Digger Tools • Hand & Pneumatic Chisels
Hand, Pneumatic & Electric Hammer Drills • Plumbing Tools



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FINE TOOLS & TOOL STEELS SINCE 1918

For more facts, use Reader-Reply Card opposite page 18 and circle No. 361

CONTRACTORS AND ENGINEERS



4 Workmen backfill along the shop-made 15-foot slipform extension, which lends temporary support to freshly placed concrete.

5 As the rig moves along, with a third axle supporting the 15-foot slip form, an oscillating vibrator makes transverse ridges in the surface so that a good bond will be set up between concrete and leveling course.



middle of the strip being widened. Since this was a 2-foot widening job, the belt extended about one foot over the edge of the existing roadway slab. With the belt dumping concrete at the midpoint of the strip, no concrete was lost, since it could not overshoot the area being paved. As an added protection against loss, the widener has an outside vertical plate. Another vertical plate at the front of the widener prevents loss of concrete at this end if the machine stops or slows down.

A horizontal plate, 2 feet square, rides on the surface of the concrete to provide the widener with the vibratory action needed for proper con-

solidation of the concrete. This belt-driven, oscillating-type vibrator is powered by a takeoff from the main transmission of the Apsco spreader and transferred by belt through an idler.

The idler allows the rig to be adjusted so that it can pave a wider strip. Only the belt connecting the vibrator and the idler has to be replaced when such an adjustment is made. The belt between the idler and the power takeoff remains in place. One belt could not be used between the main power take-off and the vibrator because its length would be

(Concluded on next page)

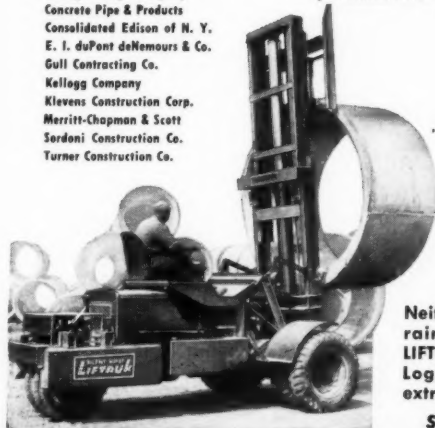
HEAVY-DUTY BEAUTY

8 SIZES:
3-5-6-7-1/2
8-10-12-15
TONS CAPACITY

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This Fork Lift Truck is no "prima donna," but it is a heavy-duty beauty with smooth-as-silk performance.

- Extra-large Construction Tires for Traction.
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Neither mud nor rough, rocky terrain will hang up SILENT HOIST LIFTRUK on Construction Sites... in Logging, Lumbering, and other extra-tough applications.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 362

MIX and PAVE

-ALL IN ONE OPERATION



THE BURCH

MODEL 12

PAVER and RESURFACER

ONE-MAN
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Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine. FOR SOIL STABILIZATION — GRAVEL ROADS — BITUMINOUS MIX-IN-PLACE. Write Dept. CE for literature.

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MANUFACTURERS OF EQUIPMENT
FOR CONSTRUCTION AND MAINTENANCE
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Simplify

Preventive Maintenance on Construction Industry's Hydraulic Equipment

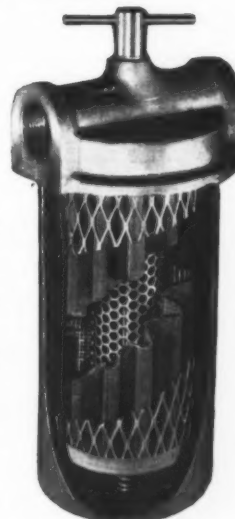
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SUMP TYPE (cutaway)

Change excessive
and costly
"DOWN-TIME"
to
profitable
"OPERATING TIME"



LINE TYPE (cutaway)

Any workman can easily disassemble, thoroughly clean and reassemble MARVEL Synclinal FILTERS, on the spot, in a matter of minutes. RESULT—the equivalent of a brand new filter, ready for longer periods of dependable service and protection.

MARVEL Synclinal FILTERS are "permanent type" filters because there are no throw-away parts to buy or replace, no moving parts to wear out or break down. Your FIRST COST is your ONLY COST.

Marvel's BALANCED Synclinal design offers 2½ times more ACTIVE filtering area with sufficient storage capacity for filtered-out damaging particles; thus, longer periods of productive operation are attained at minimum filter maintenance "down-time."

You can further simplify your preventive maintenance program by standardizing with MARVEL Synclinal FILTERS, by specifying them on all new equipment and installing them on existing equipment.

FOR EFFICIENT FILTRATION OF Hydraulic Oils, Fire-resistant Fluids, Coolants, Lubricants, Water —

and

FOR DEPENDABLE PROTECTION on all Hydraulic and other Low Pressure Circulating Systems —

Investigate MARVEL SYNCLINAL FILTERS

OVER 650 Original Equipment Manufacturers
install MARVEL SYNCLINAL FILTERS as Standard Equipment

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of mesh sizes range from coarse 30 to fine 200.

Immediate Delivery

As in the past, Marvel continues to offer IMMEDIATE DELIVERY!

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Company
City
State

For more facts, use coupon

(Continued from preceding page)

excessive, making the rig inefficient.

One of the desirable features of the rig is that the oscillating action of the vibrator makes transverse ridges in the concrete, giving the surface a rough texture. Since most widened roadways get a new wearing surface of asphaltic concrete, the rough surface provides a good bond between the concrete strip and the binder course. If a widened strip does not have to be covered, hand finishing can give the concrete a smooth surface.

Slip-form extension

On this project, Lizza fabricated a 15-foot slip form and attached it to the spreader to extend the short slip form of the widener. The 15-foot extension gave the workmen ample time to place backfill against it. The backfill, tamped against this extra length, supported the concrete after the slip form had passed by. However, it was necessary to rig a third axle to the spreading machine so that the extension had enough support. A chain belt drove the new axle.

Trench cut by attachment

A contractor-rigged attachment on a Caterpillar motor grader blade started the work by cutting a 3-foot-wide and 7-inch-deep trench along the south edge of the two-lane roadway. This attachment consisted of a 3-foot plate, welded to the center of the grader blade, and extending down 7 inches from the lower edge. The attachment permitted the grader operator to rest the blade on the existing roadway while the attachment cut the 7-inch-deep trench. The attachment is able to cut a trench to any width up to 3 feet, depending on the angle to which it is turned.

At the start of the project, the grader blade was positioned perpendicular to the axis of the roadway so that the attachment dug a 3-foot wide trench. The trench was dug to this width in case it became necessary to use formwork in pouring the widening strip. As soon as the widener went to work, however, the motor grader operator dug the trench only 2½ feet wide, since it was obvious that no forms would be needed.

Concrete work

Concrete for the widening strip, with a slump of 1½ to 2 inches, was delivered by ready-mix trucks. These backed up to the spreader and moved forward under their own power as they emptied. This made for smoother and faster operation of the spreader.

After the concrete had been placed, its rough surface was broomed to make it even rougher. This assured a good bond between the concrete and the 1½-inch binder course put down by a Barber-Greene finisher. Joints, consisting of filler board, were placed in the concrete, in line with existing road joints more than ½-inch wide. The minimum distance between strip joints was 100 feet.

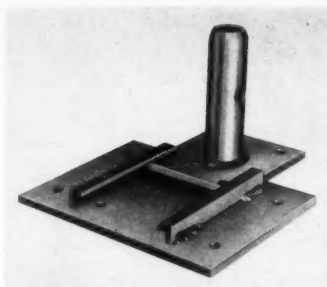
The asphaltic-concrete binder-leveling course and the 1-inch wearing surface were laid in 12-foot widths by the Barber-Greene finisher, then

compacted by a Buffalo-Springfield three-wheel tandem 15 to 18-ton roller.

George Kelly was superintendent for the project for Lizza & Sons, Inc. M. E. Nemschick is resident engineer for the New York Department of Public Works. THE END

Announce new plate for scaffold shoring

■ A specially-designed shoring plate is being offered by the Universal Mfg. Corp., for use on scaffold-shoring applications. The plate makes use of



The Universal Mfg. Corp.'s S681 shoring plate for scaffold shoring.

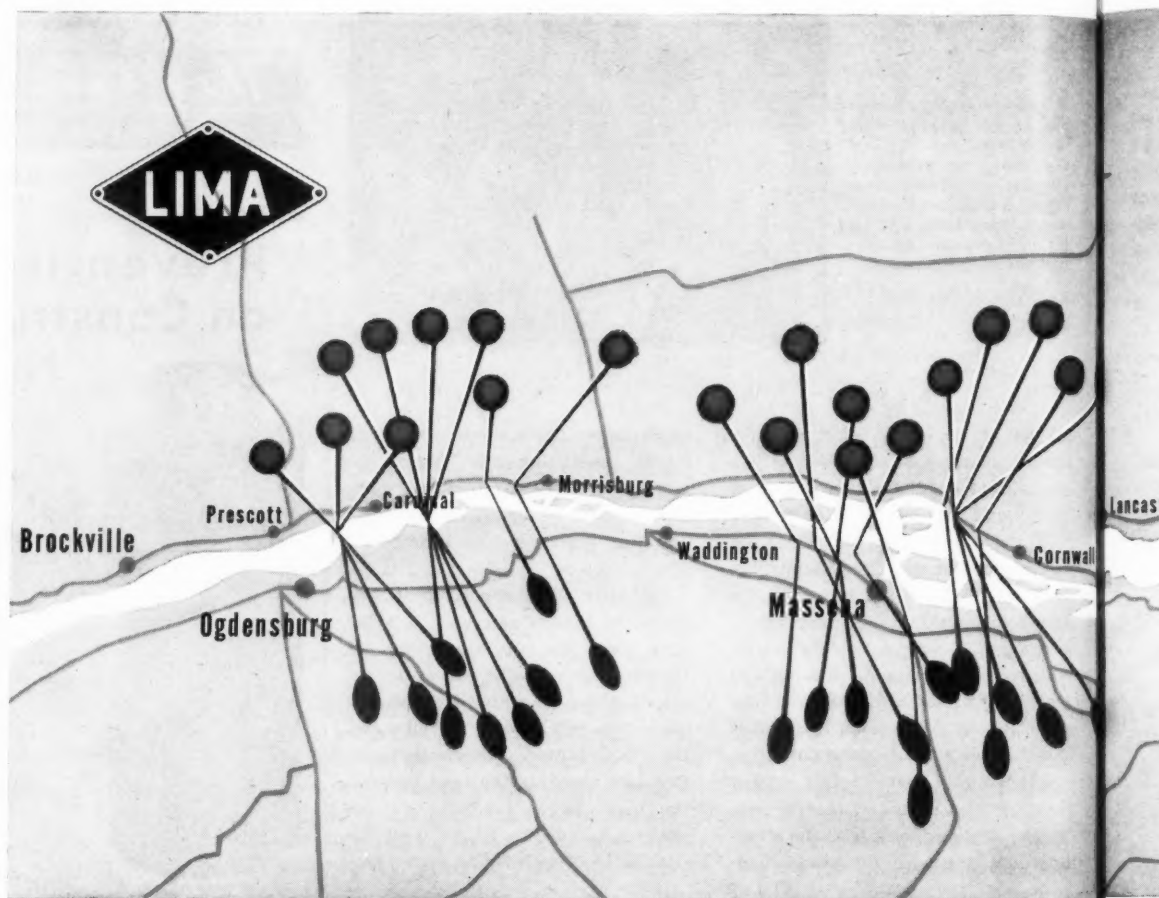
standard base plates by providing additional area on which to lap the

ledgers on shoring jobs.

Designated the S681, the plate is designed to slide over the standard Universal S25 and S20 base plates and provide an additional 6×8-inch bearing surface. An extra feature of the plate is the dichromate galvanizing finish said to eliminate rust and greatly increase the work life of the scaffolding.

A bolt-on plate of the same dimensions is also available.

For further information, write to the Universal Mfg. Corp., Zellenople, Pa., or use the Request Card at page 18. Circle No. 55.



along the St. Lawrence Seaway . . . LIMA gives the BIG lift

You'll find plenty of tough digging along the St. Lawrence Seaway. And all along the route—whether the digging's tough or easy—you'll find more than a score of Limas giving Seaway contractors the *big lift* that keeps their jobs moving steadily. Every contractor with Limas on the job is on time . . . or even ahead of schedule.

Due for completion in 1959, work is now well along on the 114-mile Seaway link between Ogdensburg, N. Y., and Montreal. The primary job is widening (to 450 ft.) and deepening (to 27 ft.) existing channels to permit passage of deep-draft ocean going vessels . . . all the way from the open sea to the heart of the continent. Also vital to the project is the building of locks, dams and power houses along the route.

From end to end of this mammoth undertaking, you find rugged Lima shovels and draglines hard

at work moving millions of tons of rock, shale and earth . . . working on every type of footing. And wherever you see a Lima, you know that the work is on time. These quality-built machines move every type of material in fast, steady bites. More important, they've got the built-in strength and endurance to keep them on the job hour-after-hour, day-after-day, week-after-week.

Seaway contractors are proving every day that Lima quality means high output, low downtime on even the toughest jobs. Let their experience be your guide! Get the full story today on the Lima cranes, shovels, draglines or pullshovels on crawlers or rubber mounts that can speed your digging and lifting jobs for greater profit. See your nearby Lima distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

CONTRACTORS AND ENGINEERS

Case history

Specially-designed rig speeds curb-breaking

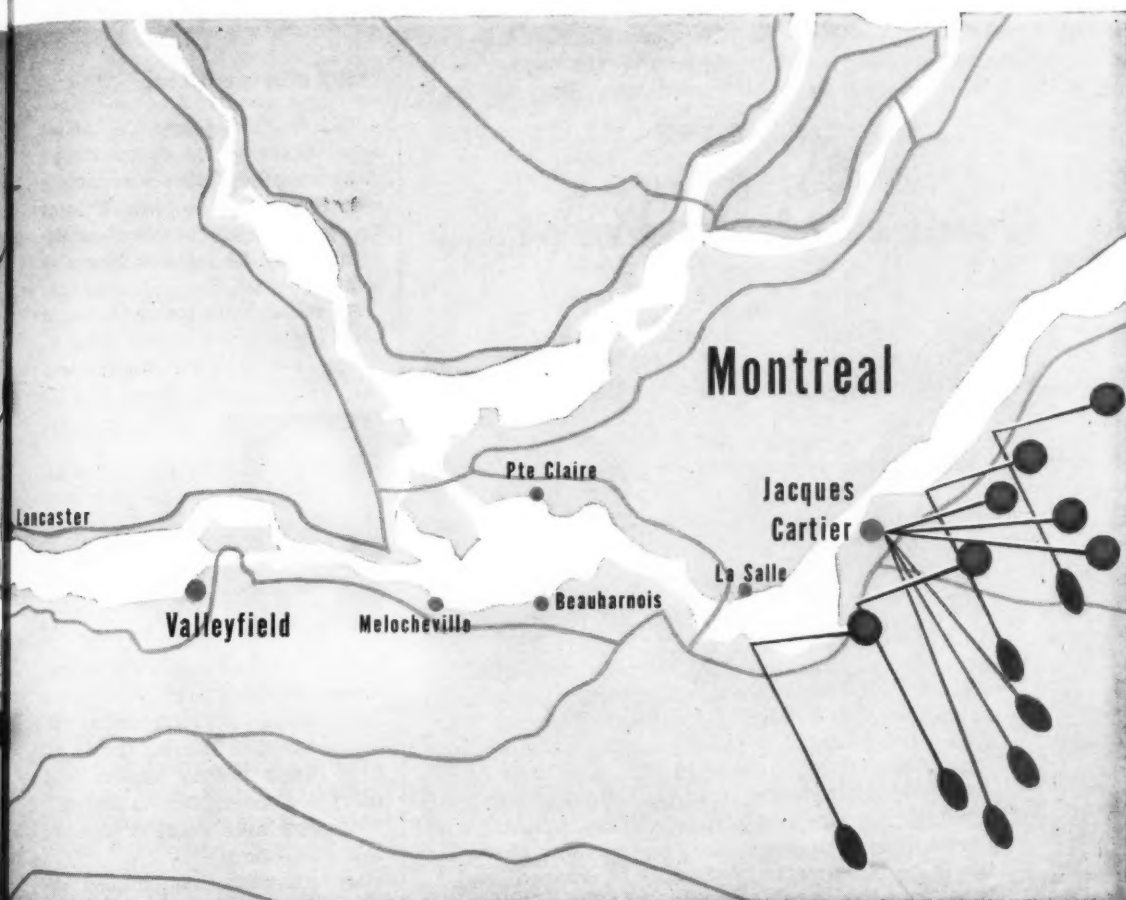
Under normal operating conditions, a specially-designed curb breaker removed up to 8,000 linear feet of curb in a 12-hour day while working on road-widening projects for the Iowa State Highway Commission. Breaking costs for the rig and its two operators were as low as 3½ cents per foot of curb.

The rig was designed by C. L. Gleason, construction engineer for the

This Armstrong curb breaker removed as much as 8,000 feet of curb in a 12-hour day on a road-widening job for the Iowa State Highway Commission.

Iowa State Highway Commission, and is being manufactured by J. D. Armstrong Heavy Hauling, Inc., Ames, Iowa, a firm that also builds low-bed trailers and tractor push-plates.

Adaptable to other types of concrete breaking, the machine was de-



signed particularly for the removal of lip curbs from concrete pavements, an important part of the extensive road-widening program currently under way in Iowa. The rig which set the 8,000-feet-per-day mark is owned by the Hallet Construction Co., Crosby, Minn., curb-breaking subcontractor to Booth & Olson, Inc., Sioux City, Iowa, a contractor doing the widening work on parts of U. S. 18 and U. S. 63 in Iowa.

The main frame of the curb breaker is fabricated of welded sections of 10-inch channel steel. The running gear consists of standard axles and shafts fitted with standard truck tires, dual at the rear and single at the front. The ram arm is mounted on a pivot to one side at the rear of the chassis. In working position, it extends perpendicular from the frame and reaches out over the shoulder of the road.

The breaker is an air ram fitted with a cutter head to which a special steel bit has been welded. A hydraulic cylinder raises and lowers the ram so that the breaking operator can accurately aim the ram at a consistent elevation. Two men handle the rig. One steers the machine while the other handles the breaking controls and those propelling the machine.

Power for all operations is provided by a compressor mounted at the front. The compressor can be removed and used for other operations when the breaker is idle. A reversible air motor propels the machine and a compound transmission provides speeds from 7 mph down to a slow creep.

For more information on the curb breaker write to J. D. Armstrong Heavy Hauling, Inc., Box 307, Ames, Iowa, or use the Request Card at page 18. Circle No. 197.

Film treats problems of highway construction

Methods used by communities to solve highway-construction problems are portrayed in a new film from the Ford Motor Co., Dearborn, Mich. Entitled "Freedom of the American Road", the 27-minute, sound-color film also shows traffic-control and safety methods.

The movie may be obtained from the Film Library of the Ford Motor Co., 16400 Michigan Ave., Dearborn, Mich.; 16 E. 52nd St., New York, N. Y.; or 4303 Telegraph Ave., Oakland 9, Calif.

Keep contractors on time or ahead of schedule



This rugged 6-yd. LIMA Type 2400 is excavating the Lachine Rapid Channel for Miron Freres, Montreal. Their contracts call for digging over 1 million tons of earth. On this job, not due for completion until October, '56, work is now months ahead of schedule. That's LIMA quality pays off . . . with design and construction extras that let it handle the toughest jobs without costly breakdowns. A LIMA on job keeps the job moving . . . fast!



In digging like this, LIMA extras—like piston-ring-type dirt seals and retainers in crawler rollers—keep the machines on the job. This 4-yd. LIMA Type 1601, excavating for the Robinson Bay Lock, Massena, N. Y., is owned by Tecan Corp., of Dallas, Texas. Their LIMAs keep the work moving on schedule.



Walsh Construction, Toronto, depends on LIMAs like this Type 1601 to speed work on their dike and channel project at St. Lambert. They know that their fast-working LIMAs will keep the earth moving steadily in any weather, on any footing. The built-in strength and durability of these machines keep them working constantly . . . without costly, job-delaying downtime.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 364

Names in the news

WASHO elects Greer as new president

D. C. Greer, state highway engineer for the Texas State Highway Department and a past president of the American Association of State Highway Officials, was named president of the Western Association of State Highway Officials at the annual conference in Phoenix, Ariz. The Western association includes 13 western states and Hawaii.

Active in AASHO work for many



Heading the WASHO for the next year is DeWitt Carlock Greer, Texas state highway engineer.

years, Greer served as a field engineer, and engineer of design and construction for the Texas State Highway Commission. A graduate of Texas A & M with a degree in civil engineering, he has been state highway engineer in Texas for the past 16 years.

The Moles elect officers

Thomas J. Walsh, Jr., president of the Walsh Construction Co., New York, N. Y., has been elected president of The Moles, an association of tunneling and heavy-construction engineers and executives. He succeeds A. Holmes Crimmins in the post.

Elected first and second vice president, respectively, were Richard A. Johnson of the Arthur A. Johnson Corp., and Howard A. Collins of the Howard Collins Construction Co. Gilbert M. Serber, Stock Construction Co., was reelected secretary, and Richard M. Johnsen of The Foundation Co., will serve as treasurer. R. E. Savage, Northwest Engineering Co., was named sergeant-at-arms, and Harry T. Immerman was designated chair-



Thomas J. Walsh, Jr., president-elect of The Moles.

man of the Award Committee for the coming year.

Five trustees were also elected.

NSPE elects officers

The National Society of Professional Engineers has elected Robert J. Rhinehart, a division superintendent of the Arkansas Power & Light Co., to the post of president of the organization. He succeeds Allison C. Neff in the post.

Six regional vice presidents and a treasurer were also elected. Allen H. Kidder will head the Northeastern



Robert J. Rhinehart, president-elect of the National Society of Professional Engineers.

Region; Warner Howe, the Southeastern Region; Clark A. Dunn, the Southwestern Region; Lindley R. Durkee, Western Region; Garvin H. Dyer, North Central Region; and Harry G. Kennedy, Central Region.

Russell B. Allen will serve his ninth term as treasurer.

Mr. Rhinehart will officially assume his duties on July 1.

ASCE names metropolitan engineer of the year

The American Society of Civil Engineers has designated Dr. Jacob Feld as its Metropolitan Civil Engineer for

Dr. Jacob Feld, ASCE Metropolitan Civil Engineer of the year.



the Year 1955. Dr. Feld, of New York, N. Y., is a consulting engineer for the design and supervision of the foundation and structural work of the New York Coliseum.

A member of the American Society of Civil Engineers, the New York Academy of Science, and a fellow of the American Association for the Advancement of Science, Dr. Feld is a graduate of the City College of New York and holds professional degrees from the University of Cincinnati, Ohio.

Ask

Cedarapids

Built by IOWA

Owners about Profit...

Someplace near you there's sure to be a Cedarapids plant working. Ask the owner what he thinks about the performance of that plant!

We'll bet you get answers like these—

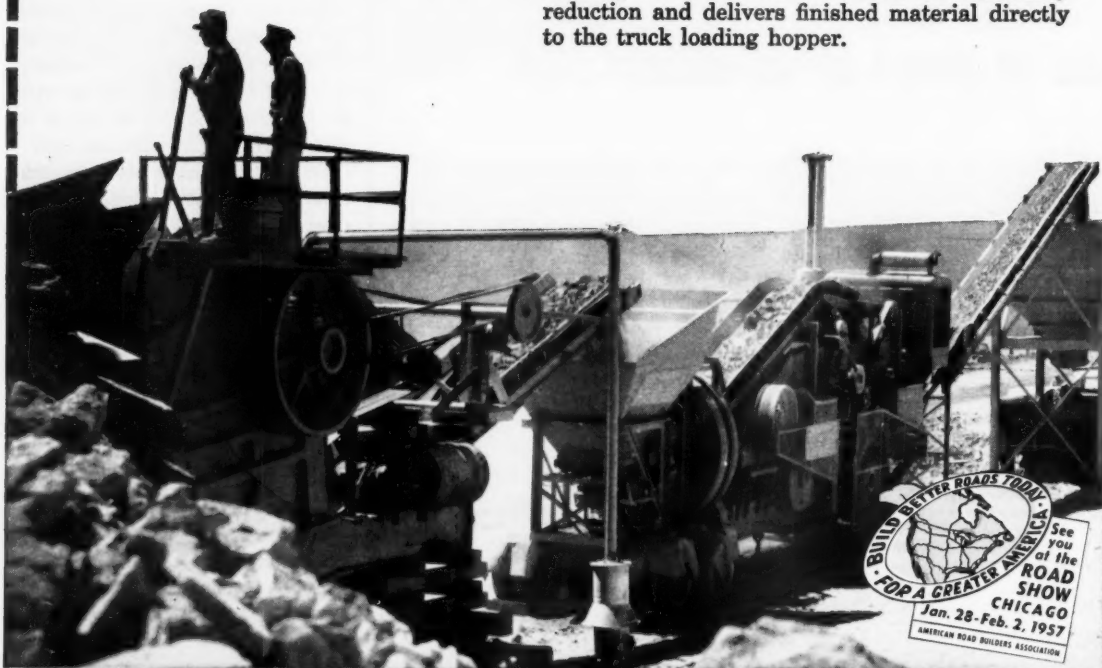
"We're crushing 100%, averaging 105 tons per hour, with no maintenance costs in 12 months' operation"—a New York Commander owner.

"The only competition I have around here is another Cedarapids plant"—a Wisconsin crushing plant owner.

Call your Cedarapids distributor for the location of the nearest working Cedarapids plant—then ask him to explain the Cedarapids features that will make more money for you.

Set up to produce about 75,000 tons of crushed stone for sub-base on the north end of the Pennsylvania Turnpike Extension, this 3-unit Cedarapids plant is turning out 150 tons per hour for Susquehanna Quarry Co., Millersburg, Pa. Rock from an abandoned strip mine is fed to the 25"x40" primary jaw crusher over a vibrating grizzly which bypasses fines before they reach the crushing chamber to permit greater production of crushed material from the Portable Primary unit. The versatile Cedarapids Commander is used for secondary reduction and delivers finished material directly to the truck loading hopper.

SUSQUEHANNA QUARRY CO.
produces
150 TONS PER HOUR
of crushed rock for
Pennsylvania
Turnpike Extension



IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 365

F. H. McGraw appoints subsidiary executive

The F. H. McGraw & Co., engineers and constructors of New York, N. Y., has appointed George J. O'Connell treasurer and general manager of McGraw Industries, Inc., Hartford, Conn., equipment subsidiary of the



George J. O'Connell, treasurer and general manager of McGraw Industries, Inc.

firm. He will be responsible for all McGraw construction machinery purchases, maintenance, and rentals.

With the firm since 1940, O'Connell has served in both field and office posts, including the company's naval air base project in Bermuda and job-equipment and supply positions. He will maintain offices in Hartford, Conn.

N. J. names Fritzsche state highway engineer

Otto Herbert Fritzsche, a veteran of 31 years with the department, has been named state highway engineer by the New Jersey State Highway Department. After starting in 1925 as a member of the design and construction division of the department, he then assisted in the organization of the department's Bureau of Planning and Research, becoming its director in 1948.

He later served as acting director and chief road engineer, assistant state highway engineer, and most recently as director of planning and construction.

Otto Herbert Fritzsche, new state highway engineer for the New Jersey State Highway Department.



A graduate of Lehigh University with a degree in civil engineering, Fritzsche is a member of the Association of Highway Officials of the North Atlantic States, the New Jersey Society of Professional Engineers, and the Institute of Traffic Engineering of the American Society of State Highway Officials.

Institute appoints engineer

The Asphalt Institute has appointed Horace S. Hudson to the post of district engineer for the state of Oklahoma. Formerly associated with the Texas Highway Department, Hudson also has sales engineer experience.

A member of the Association of Asphalt Paving Technologists and the Texas Society of Professional Engineers, he will make his headquarters in Oklahoma City.

Corps of Engineers news

The district engineer at Okinawa, Col. R. J. B. Page, has been named district engineer at Seattle, Wash., by the U. S. Army Corps of Engineers. Succeeding Col. N. A. Matthias, Col. Page has also served in Iceland, Europe, and Korea, as well as in the office of the Army's Chief of Engineers, Washington, D. C.

Col. Edward D. Comm, deputy chief of staff for plans and logistics operations, U. S. Army, Europe, Communi-

cations Zone, has been appointed district engineer at Louisville, Ky. Succeeding Col. William D. Milne, Col. Comm will assume his new post at the end of July.

Col. Gunnard W. Carlson will become resident member of the Board of Engineers for Rivers and Harbors at Washington, D. C. He succeeds Col. Hubert S. Miller who has retired.

Charles H. Wagner, former chief of the construction division in the Seattle district headquarters, has been transferred to Pittsburgh, Pa., as resi-

dent engineer on the construction of the New Cumberland lock and dam on the Ohio River.

Filling the newly created post of technical director at the Research and Development Laboratories at Fort Belvoir, Va., is Dr. George Howard. He will work on a program of applied research.

The new district engineer at Charleston, S. C., is Col. Parker O. Stuart. He succeeds Col. Clyde C. Zeigler who has been assigned overseas.



A Cat D315 Engine powers this ditcher working on a Houston residential development. Other Caterpillar equipment on this job includes six D8s, one D7, one D6 and two Scrapers.

Standardizing on rugged yellow equipment pays off two ways: (1) Big production at low cost and (2) fast, capable "one-stop" service from your Caterpillar Dealer.

WORKING IN TOUGH TEXAS GUMBO

F & C Equipment Co., Inc., Houston, specified a CAT® D315 Engine for this ditcher. Result: profitable production.

Digging a sewer line in Sharpstown, world's largest residential development near Houston, Texas, this Parsons Trenchliner worked 10 hours a day, 6 days a week. The F & C Equipment Co., Inc., which relies heavily on Caterpillar equipment, specified a Cat D315 Engine as original power. Field superintendent G. M. Strickler reports: "This is a big job and it takes the best equipment. We have to have something to produce with—and we find that Caterpillar units are the best so far!"

There's a reason they're "best so far!" Combining research with practical experience in the field, Caterpillar constantly improves its products to offer you the most modern equipment. Take its new line of heavy-duty engines, for instance. These rugged units are built to outwork comparable size engines of other makes. They pack more working power. They're sturdily built with such details as complete filter protection, bearings made of a special aluminum alloy, cylinder liners "Hi-Electro" hardened and chrome-faced piston rings. They use low-cost fuel without

fouling. As a result, whether you use them in a ditcher, excavator or any other type of construction machinery, you can depend on them for big production at minimum cost.

Leading manufacturers of construction machinery are supplying Cat Diesels as original power. Or your Caterpillar Dealer is ready to install them as replacement power. A full line is available, capable of producing up to 650 HP (maximum output capacity). See your Caterpillar Dealer for details about these modern heavy-duty diesels!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**MODERN HEAVY-DUTY
CONSTRUCTION POWER**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 366



Hot-mix is dumped from the Ford truck to the hopper of the Barber-Greene finisher putting down a surface course in an 11-foot lane. About 30,000 tons of material went into this 12-mile stretch.



Hot-mix production stays high even though aggregates are wet

Bituminous plant, adapted to meet needs of contractor, turns out 175 tons of material hourly for 12-mile road job

Despite the fact that it was working with saturated Ohio River mineral aggregate, one of the newer hot-plants on the market took less than ten days to reach a production of 175 tons of material per hour. And it did this on 1.8 gallons of burner fuel per ton of hot-mix.

This was the first use of a Pioneer Model 102 Continuflo by the owner, Tri-State Paving Corp., Martins Ferry, Ohio, contractor for paving 12 miles of Route 2 between Belleville and Ravenswood, W. Va. While a floating bucket-line dredge and aggregate screening-washing plant owned by Ohio River Sand & Gravel Co. turned out material to feed the plant and had a backlog of some 12,000 tons before the asphalt plant went into production, the hot-plant was out of aggregate in less than three weeks.

This, however, was due to the good performance of the hot-plant rather than any deficiency in the operation of the endless-bucket-type dredge that reached about 40 feet to the bottom of the Ohio River to recover natural stream gravel. Driven by diesel-electric-generated power, the dredge was equipped with a set of low-head vibrating screens, crushing equipment, and a washing plant. A towboat and a fleet of 20 barges with capacities ranging from 350 to 800 cubic yards were available for transporting and storing the material.

Handling aggregate

As it was delivered to a landing at the river-bank location of the job, material was unloaded from the barges by a steam-powered derrick boat with Owen 13½-yard clamshell and charged to a Pioneer 20-yard surge hopper equipped with an apron-type feeder.

A conveyor leading from under this hopper to a point at the top of the river bank consisted of a 24-inch belt driven by an International U-4 diesel engine. This stationary conveyor discharged to three portable conveyors, driven by International U-2 and U-2A diesels, which were moved as various stockpiles were built up.

Three sizes of stone were stockpiled: 1-inch-minus material for the base course, ½-inch-minus for the top course, and river sand. These were stacked initially in a Pioneer bin by a Lima ¾-yard crane with clamshell.

In the plant, aggregate and sand



COMPLETE S-100 SIMPLICITY PLANT Loaded on cars

at 41c per. lb.

SIMPLICITY PLANTS

are cheaper than.....

PEANUTS

(over \$1.00 per lb.)



CAR No.	NET WT.
L. & N. 21396	40,000 lbs.
N. & W. 32813	71,600 lbs.
P. R. R. 342731	40,700 lbs.
Southern 315769	27,900 lbs.
Southern 408008	47,400 lbs.
S. P. 142668	17,400 lbs.
N. Y. C. 638445	34,300 lbs.

Total 279,300 lbs.

Sales Price
of Plant..... \$114,503.00

price per pound

41c

THE SIMPLICITY SYSTEM

FROM BUILDER TO BUYER
BETWEEN MEN WHO KNOW

**THERE'S A SIMPLICITY PLANT
NEAR YOU**

On request, we'll be glad to send you the
name and location of a nearby installation.

DEPENDABLE
THE SIMPLICITY SYSTEM COMPANY

RIVERSIDE DRIVE

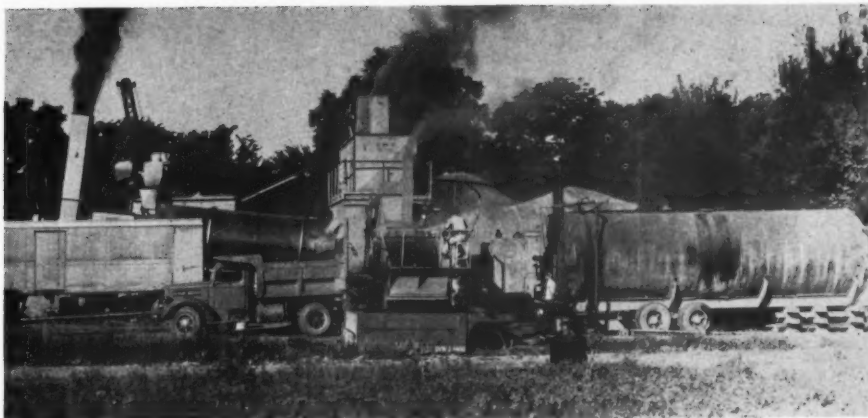
PHONE 2-2144

CHATTANOOGA 6, TENNESSEE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 367

by JIM LAMPERT, General superintendent,
Tri-State Paving Corp., Martins Ferry, Ohio

The Pioneer 102 goes to work for Tri-State Paving Corp., Martins Ferry, Ohio, for the first time. The all-portable plant will supplement the firm's stationary and semi-stationary plants in a five-state area.



was shake-fed from the primary hopper by a Syntron electric vibrator unit, and then by means of a two-way apron feeder to the cold elevator conveyor. This dumped the material into the plant dryer, where fines were recovered by the dust collector and fed back to the boot of the hot elevator. After being sized, the material was separated into a three-compartment pull for base-course material and a two-compartment pull for surface material.

The base-course mix consisted of 33 per cent sand, 4.5 per cent asphalt, and 1-inch-minus stone. Surface-course material was 46 per cent sand, 6.3 per cent asphalt, and the remainder, the 1/2-inch-minus material.

The 85 to 100 penetration bitumen, supplied to the job by Ashland Oil & Refining Co., Ashland, Ky., was trucked in by transports, unloaded at the heater tanks, and brought to a temperature of 275 degrees before being mixed with the aggregates. A small, truck-loading hopper made it possible to store material long enough so that plant production did not have to stop even if trucks lagged a little in picking up loads.

Good paving conditions

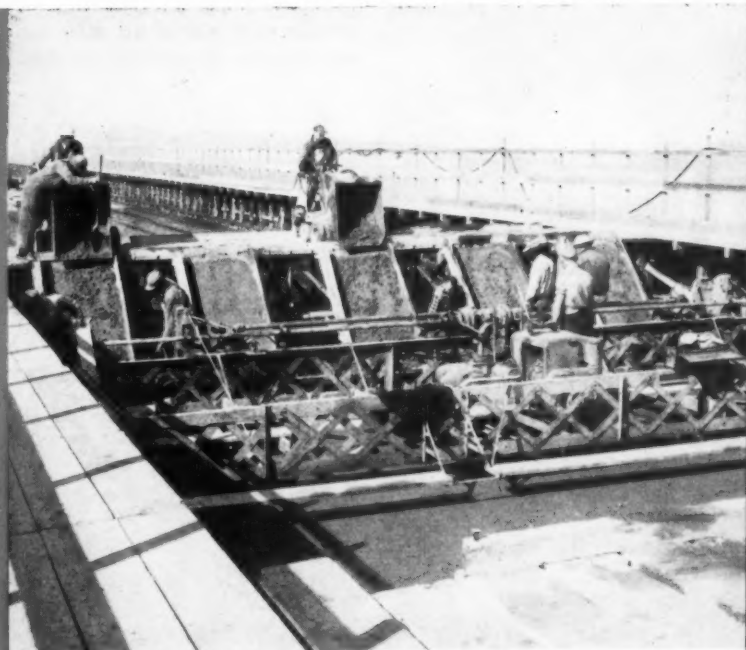
C. Boncrette Trucking Co., Moundsville, W. Va., used a fleet of International, GMC and Ford dump trucks to bring the hot-mix to the paver. The grade had already been established for the new section by state forces before the 22-foot-wide and 3-inch-thick bituminous pavement was put down in two courses. The base contained 220 pounds per square yard, and the surface, 107 pounds per square yard. Altogether, 30,000 tons of plant-mix went into the stretch, and 30,000 tons of gravel were used for the roadway shoulders.

Hot and dry weather made for almost ideal paving conditions, and the laydown work went rapidly. A Barber-Greene finisher was used, adjusted for two 11 1/2-foot lanes on the base course and two 11-foot lanes on the surface course. After the initial knockdown roll by a Galion three-wheel, 8-ton machine, two Galion tandems, ballasted to 10 to 12 tons, completed the compaction work.

Fills contractor need

When Tri-State bought the central
(Continued on next page)

For more facts, circle No. 368→



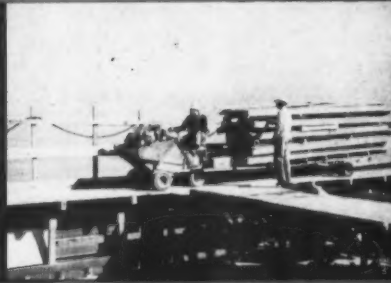
Whiteman Power Buggies speed concrete out ramp on one side of Bridge—return on opposite ramp for next load. Keep pouring operation moving at a fast pace. These photographs courtesy of Construction Illustrated.



Whiteman Power Buggies load from truck mixers a quarter mile from pouring site.



Cross-ramps for pouring operations handle five Power Buggies at one time.



Whiteman Power Buggies haul materials tool Here a load of forms is moved to a new location.

Pouring 14,200 cu. yds. of concrete decking on the Richmond-San Rafael Bridge crossing San Francisco Bay requires carrying concrete over a 1/4 mile long ramp from truck-mixer to pouring site. This long haul would have been a slow, back-breaker with hand buggies, but fast, efficient Whiteman Power Buggies placed the concrete in record time.

Whiteman Power Buggies are gluttons for work — never tire or slow down. Their versatility and performance will keep your concrete-placing operations moving on a fast schedule. You'll find Power Buggies priced to quickly pay for themselves... often on their first job. Call your Whiteman Distributor today... or send coupon below for complete details.



Whiteman

THE LEADER
IN CONCRETE
EQUIPMENT



TRUCK MIXERS



POWER BUGGIES



VIBRATORS



SCREEDING MACHINES



FLOATING-FINISHING MACHINES

WHITEMAN MANUFACTURING CO., DEPT. CE
13020 Pierce St., Pacoima (L.A.), Calif.

Please send prices, catalogs and name of distributor for

☐ Power Buggies ☐ Screeding Machines ☐ Vibrators

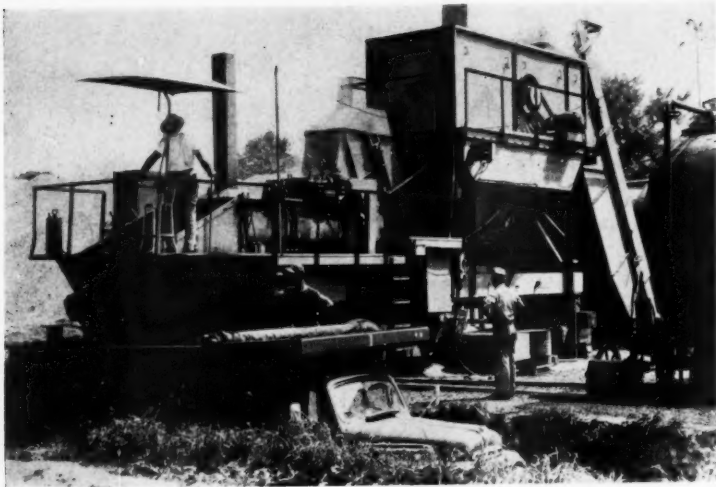
☐ Floating-Finishing Machines ☐ Truck Mixers

Name.....

Firm.....

Address.....

City..... Zone..... State.....



A fleet of rented batch trucks keeps the mix moving from plant to laydown machine. A depressed haul road at the plant permitted easy loading of the hauling fleet.

(Continued from preceding page)
hot-mix bituminous plant, it was already the owner of nine other plants—five of them stationary units and three of the semi-stationary type. But since the firm specialized in bituminous paving in West Virginia, Ohio, Pennsylvania, Maryland and Kentucky, and both Ohio and Pennsylvania required a four-bin separation, the firm needed a fully portable high-production plant. This plant has two portable units. One is the dryer and dust collector, mounted on one chas-

sis, the other is the gradation and mixing unit.

Other auxiliary units can either be loaded for transport or mounted on rubber for portability. On Tri-State's setup, these units included a Pioneer No. 450 hot elevator, a No. 421 cold conveyor, a No. 363 three-aggregate feeder, dust-return conveyor, and two 11,000-gallon-asphalt-storage tanks. A 2,000-gallon-truck-transport for No. 2 diesel fuel, a 7,000-gallon-truck transport for No. 4 burner fuel, a portable field laboratory for gradation tests and asphalt extractions, and several small tanks for priming asphalt and other materials were also included.

Although designed to use a combination of diesel and electric motor drives, the plant used by Tri-State has a generating set—so that the firm will never have to rely on electric power at a site. The plant can also use steam or circulating hot oil in its main heating system, but Tri-State turned to the use of hot oil instead of steam for heating. Thus the firm does not have to depend on a good supply of water from local sources to generate steam for heating purposes.

Central mix plant

The central mix plant has a capacity of 100 to 200 tons per hour when used with the No. 382 dryer and dust-collector unit. It has a 4×12 top screen deck and a 4×10 bottom screen that is spring mounted at an angle of 10 degrees. This screen, with V-belt drive, goes through a 3/8-inch stroke at 1,000 rpm.

Each of the four bin compartments has automatic low and high material-level indicators. If material in one of the bins reaches a low level, power is automatically shut off. Apron-type gates measure 5 feet×38 inches, and are calibrated and controlled by lever for final adjustment. A double-chain endless-bucket elevator with a 160-cubic-yard capacity is used.

The 8-foot×46-inch pugmill, a twin-shaft single-speed type, has a special anti-caking and self-cleaning trough. Asphalt metering is done by a Yale & Towne 3-inch, 85-gpm-capacity pump that can be controlled from the operator's platform. A Yale & Towne 4-inch jacketed transfer pump is used for the recirculating system, which has a capacity of 200 gpm.

Dryer-dust collector

The main dryer drum, 90 inches×24 feet, rolls through two driving trunnions as it dries aggregates at a temperature of 275 degrees. An auxiliary air inlet cools the discharge end of the drum and provides extra air to the unit. This setup was equipped with a Hopkins low-pressure four-burner fuel system.

The dust-collection system, a West-
(Concluded on next page, col. 1)



THE RUHR MODEL M1 GRAPPLE

*Like the claws of a bird...
the fingers of a hand...
it closes with a giant's grip
...yes, to 50 tons!*

Newly imported from one of Germany's oldest and most respected manufacturing firms... Ruhr Grapples are now available to American industry through American distributors. After two years of intensive research and development, Hoesch Werke of Dortmund presents this greatly improved design... with complete quality control from steel making to finished product.

Each of the eight tines of the grapple is positively activated, independent of each other like fingers of a giant hand, to close in on irregular shaped material or objects. The tines wriggle and dig deep into the object or material, then seize and hold the load with a grip of up to 50 tons, or five times the weight of the grapple. Points of all tines are hard-faced to resist abrasive wear for longest service on



the toughest jobs. For extremely heavy-duty applications, wear plates of manganese steel are available for heavy model grapples.

Ideal for handling rock, scrap, earth, demolition and many other types of materials. Ruhr Grapples can increase hourly yardage or tonnage and lower costs. Ruhr Grapples for general materials handling are available in sizes from 1/4 to 3 1/3 cu. yds. Caisson Diggers available with shell sizes from 15 3/4" to 98". Pulpwood Grapples available from 1.3 to 3.9 cu. yds. Ask your equipment dealer to tell you more about Ruhr Grapples or write direct for information.

ATTENTION EQUIPMENT DEALERS

A few choice, profitable territories to handle Ruhr Grapples are still available on an exclusive franchise basis... also available—Line Pipe in large quantities direct from the mills of Hoesch and Mannesmann-Hoesch. Hoesch Interlocking Steel Piling can also be supplied for your needs. Your inquiries are invited.



1411 Walnut Street, Philadelphia 2, Pa.

SOLE AGENTS FOR THE AMERICAS-HOESCH EXPORT-RUHR GRAPPLES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 369



The Fruehauf-Schonrock Volume-Dump cable-operated trailer features greater capacity for its size.

Cable-dump trailer unit permits greater payload

■ The Fruehauf Trailer Co. has introduced a new cable-dump trailer called the Volume-Dump. By using cable operation for actuating the dump body, the company has eliminated costly and heavy hydraulic hoist mechanisms, and reduced the number of moving parts to five.

The saving of weight results in more payload capacity, according to the manufacturer. Another advantage of the cable-actuation feature is said to be the removal of limitations on body length. It is now possible to extend the body and thus obtain maximum length from cab to rear axles, all of which space can be devoted to payload. This allows full latitude under bridge formula rulings and permits every additional foot of trailer length to be used for increased payload capacity.

The Fruehauf-Schonrock Volume-Dump trailer is ideal for hauling sand, gravel, fill, and other construction materials, according to the company. Dumping with the tractor jackknifed up to 90 degrees is possible, and the Fruehauf hanger mechanism keeps all wheels on the ground throughout the dumping period.

For further information write to the Fruehauf Trailer Co., 10928 Harper Ave., Detroit 32, Mich., or use the Request Card that is bound in at page 18 of this issue. Circle No. 160.

(Continued from preceding page)

ern 40-5 precipitation Multicone unit, is capable of handling from 7 to 10 cubic yards of dust per hour. Its 10-foot-high exhaust stack, fanned by a powerful blower, releases about 28,000 cubic feet of air at 350 degrees every minute.

Personnel

This first job for the plant had Jim Lampert as general superintendent for Tri-State, Leo Handley as project superintendent in the field, and Steve Gocsik as plant superintendent. Frank Parker is superintendent of all plants for Tri-State, which is headed by Eugene S. Burton. Representing the West Virginia State Road Commission in the field was O. A. Trout, senior engineer.

THE END

For more facts, circle No. 370→

New plastic-lined form strips with no trouble

■ The Delta Co. has introduced a new plastic-lined fiber form which, the company reports, will not stick to the concrete under any circumstances. The new fiber form, which is called Deltube, is designed for round column pours.

The body of the tube is made of layers of long jute fiber kraft. Each layer is bonded with a waterproof adhesive. In addition, the outer ply is asphalt-saturated. The plastic lining releases immediately from the concrete and leaves a smooth, dustless

finish on the columns, the manufacturer states.

For further information write to the Delta Co., 333 W. 24th Place, Chicago, Ill., or use the Request Card at page 18. Circle No. 173.

Gar Wood sells branch

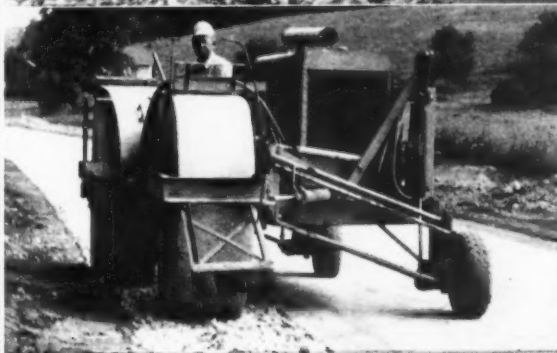
Gar Wood Industries, Inc., Wayne, Mich., has sold its factory branch in Chicago, Ill., to J. A. Sloan.

To be known as Gar Wood Chicago Truck Equipment, Inc., the new firm will provide sales and service on all Gar Wood and Gar Wood-St. Paul truck equipment.

LOOK at all you can do with a BLAW-KNOX ROAD WIDENER

Spread Base Course for Road Widening
Pave Road Widening
Spread Shoulder Material

Spread and finish concrete without forms
Pave and finish Asphalt
Spread any kind of Aggregate



BLAW-KNOX Dual Compression Trench Roller

Most flexible and economical trench roller available. Can be accurately adjusted to roll from a minimum width of 20" to a maximum of 39". The two 60" high rolls, used either "dogleg" or tracking each other, provide up to 345 pounds per lineal inch per roll. They can be hydraulically adjusted to compact to depths of 24".

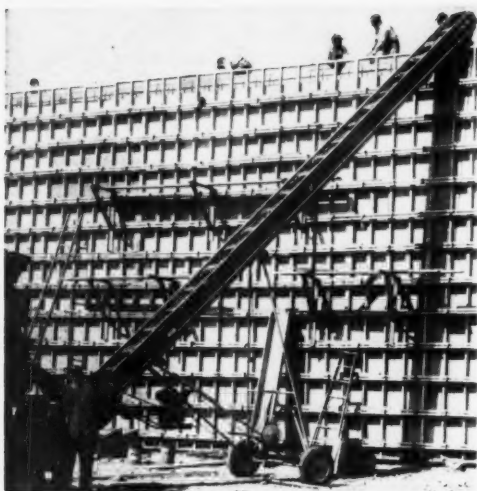
You'll like the Road Widener's ability to handle many different jobs and materials. Its versatility means that you will need a minimum of labor and equipment on any road widening or shoulder job to lower construction costs. Steady high capacity of up to 200 tons per hour keeps jobs on schedule. Tandem drive wheels on all models have power to spare for pushing the heaviest trucks up steep grades. A large hopper, special conveyor belt and hydraulically controlled strike-off gates handle any type of aggregate or asphaltic concrete in widths of 2 to 10 feet. Hydraulic controls permit gradual widening of a strip around curves when laying aggregate or asphalt. Special vibrator attachment available for all models of Road Wideners spreads and finishes concrete without the use of forms.

See your Blaw-Knox distributor . . . he can give you complete details on the models 80, 85 and 95 Road Wideners.



BLAW-KNOX COMPANY CONSTRUCTION EQUIPMENT DIVISION

40 Charleston Avenue
Mattoon, Illinois



Concrete conveyor works on escalator principle

■ An escalator-type conveyor which will carry concrete directly from transit-mix trucks to second or third-floor-level pours is manufactured by The Viking Mfg. Co.

The conveyor unit may also be adapted for use in transporting brick, concrete block, and other solid building materials to upper levels.

Recommended for use at a maximum angle of 45 degrees, the Viking Concrete Escalator will handle concrete of slumps from 0 to 6 inches. Because the concrete moves along on steps, there is said to be no segregation in the handling process. Approximately 30 cubic yards can be handled in an hour if a constant flow is maintained.

The basic unit is 40 feet long, with an 18-inch inside width, and extensions are available. Either a gasoline engine or electric motor can be used to power the unit, and it is readily transported.

A mortar tub which rides the escalator is also available.

For further information write to the Viking Mfg. Co., Manhattan, Kans., or use the Request Card at page 18. Circle No. 163.

New packaging method protects batteries

■ To provide convenience and safety in the handling and storing of dry charged batteries for petroleum-powered equipment, Globe-Union, Inc., has introduced a packaging system in which dry charged batteries and acid are stored separately in one carton for indefinite periods and are ready to be combined for immediate service.

Individual polyethylene bottles packed with the battery contain the correct amount of Globe-Union's Pow'rfill electrolyte for the battery. The acid is not added until the battery is to be installed. No loss of battery life results during storage, according to the manufacturer, and a trickle charge is not required.

Additional safety in storage is said to be derived from sealed air vents and special vent cap gaskets that effectively seal the battery case against plate contamination.

For further information write to Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 92.

The Viking Concrete Escalator delivers concrete from a transit-mix truck directly to a 26-foot-high wall pour.

Portable power drive for threading pipe

■ A lightweight, portable power drive now available for cutting, reaming, and threading pipe is made by the Oster Mfg. Co. Known as the No. 142 Featherweight Champ, the one-man-operated tool converts regular hand die-stocks, cutters, and reamers to power tools, and turns up fittings and takes them off.

The Featherweight Champ is available in models equipped with gasoline, electric, or air-power drives. All three are interchangeable. The gasoline unit is equipped with a Mercury automatic clutch, which allows the power source to reach full operating speed before the load is engaged.

With an aluminum-alloy frame and



Equipped with a Mercury automatic clutch, the Featherweight Champ power drive reaches full operating speed before the load is engaged.

For real efficiency and economy

These improved
FELKER
Machines and Blades
reduce costs, get
jobs done faster!

Pioneers in concrete cutting operations—
proven machine designs—
lower maintenance in the field!

Felker now provides the *best range* of machine designs for every concrete cutting job...from low-cost, budget models for fast patchwork to heavy-duty, production machines for rugged highway and airport applications. Specify Felker and you're getting the combined experience of *continuous research and development plus years in the field specializing in better, faster concrete cutting equipment!*



FELKER IMPROVED MODEL 364

Heavy-Duty 36 H.P. Concrete Cutter

Equipped with a 36 h.p. Wisconsin engine, this improved machine now delivers even *more* horsepower to the spindle; increases blade life under all conditions; cuts deeper and faster...on grades or on the level. Extra power reduces blade drag, handles thicker blades or multiple blade setups!

NEW TOGGLE-ACTION HAND CLUTCH CONTROL increases accessibility for engaging power drive to wheels, insures positive traction, prevents slipping or coasting on steep grades.

MORE BELTS TO SPINDLE—Four cog-type Vee-belts now transfer maximum h.p. to spindle, reduce frictional losses, last longer!

QUICK BELT TAKEUP—Hinged base on motor mount simultaneously tightens spindle belts and power drive belts, keeps blade cutting regardless of load.

PERFECT BALANCE—Model 364 can be readily tilted on front or rear wheels for fast maneuverability...easy turns in tight corners, simplified loading.

HYDRAULIC LIFT AND RETARDANT—Blade lifts out of cut and is eased into cut with velvet smoothness, prolonging blade life.

USES 14" DIAMOND BLADES (18" blades with special guard.) **EQUIPPED WITH POWER DRIVE AND AUXILIARY COOLANT PUMP** with instant-acting clutch shutoff for conserving water.

FELKER MODEL 100

Low Cost 7.5 H.P. Concrete Cutter

An efficient machine which can still be purchased on low budgets. 7.5 h.p. Wisconsin drives 8" through 12" blades. The answer to all patchwork and light cutting! Excellent maneuverability.



FELKER SPAN SAW

Multi-blade construction and operation for cutting uniform control joints in large highway and airport concrete slabs.



folding tripod, the 80-pound Feather-weight Champ can be carried by one man. Designed to handle pipe $\frac{1}{8}$ to 2 inches in diameter, the new power drive is reported to save from 1 to 6 minutes on each cutting, reaming, and turning job—depending upon the size of the pipe being threaded.

For further information write to The Oster Mfg. Co., Box 4326, Cleveland 32, Ohio, or use the Request Card at page 18. Circle No. 105.

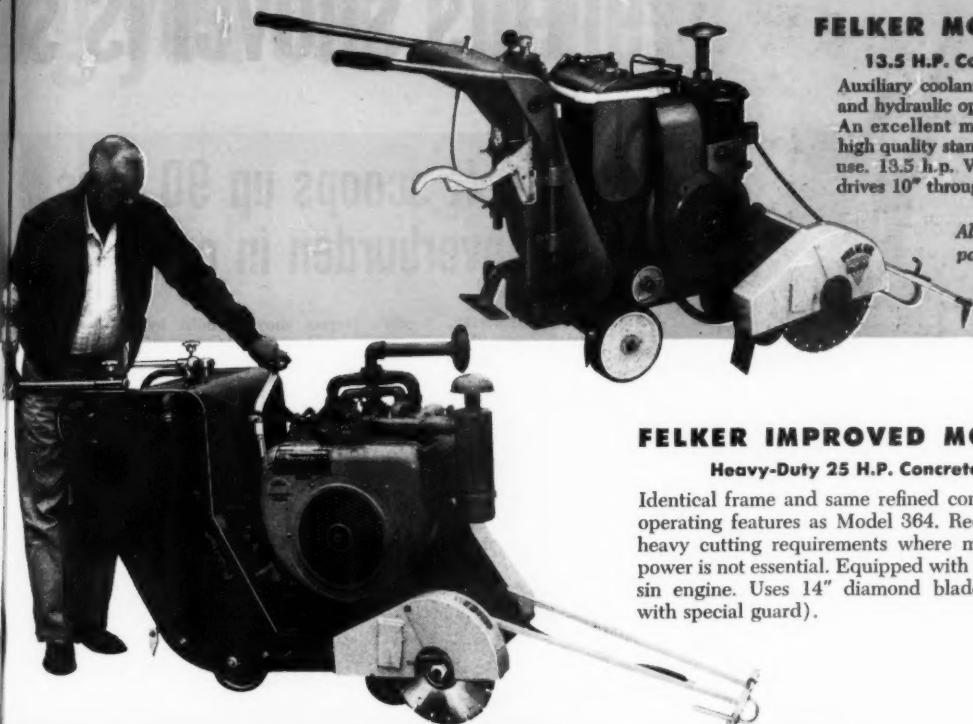
Dravo director named

K. C. Cox, chief engineer of Dravo of Canada, Ltd., since 1953, has been made a member of the board of directors of the firm. He has served Dravo Corp., Pittsburgh, Pa., in various engineering capacities since 1939.

Case history: Use of a breaker ball was prohibited on this pavement-removal job, as a decayed 14-inch gas main ran underneath the highway at this point. Robert E. Latimer, Jr., Inc., Silver Spring, Md., contractor on this job, tried unsuccessfully to use a crawler shovel, then a crawler loader. Finally a Michigan 175A tractor-shovel was put on the job, and the 8-inch-thick pavement was ripped up easily. The Michigan $2\frac{1}{4}$ -yard bucket also loaded the broken pavement into trucks for hauling away. For more information about Michigan tractor shovels write to the Construction Machinery Division, Clark Equipment Co., P. O. Box 599, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 212.



mywherever concrete is cut



FELKER MODEL 200

13.5 H.P. Concrete Cutter

Auxiliary coolant pump assembly and hydraulic operation included. An excellent machine, built to high quality standards for average use. 13.5 h.p. Wisconsin engine drives 10" through 14" blades.

Also available with power drive.

FELKER IMPROVED MODEL 254

Heavy-Duty 25 H.P. Concrete Cutter

Identical frame and same refined constructional and operating features as Model 364. Recommended for heavy cutting requirements where maximum horsepower is not essential. Equipped with 25 h.p. Wisconsin engine. Uses 14" diamond blades (18" blades with special guard).

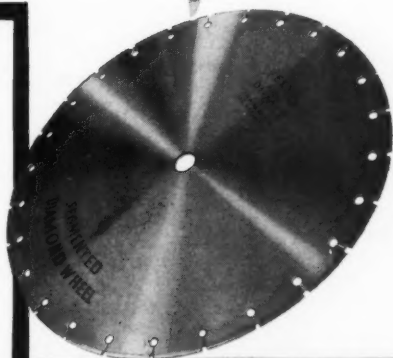
FELKER SEGMENTED-TYPE DIAMOND ABRASIVE BLADES

Accepted as the most reliable standard for greatest life, faster cutting, more footage!

Felker Segmented Diamond Blades are the ultimate answer to many, many years of service in the construction industry... testing the effects of bond variations on thousands of feet of concrete cutting—finding the most efficient combination of diamonds and bonds... first in the laboratory, then on actual construction jobs throughout the globe! In these blades, Felker has combined the *best in speed, greatest overall life, lowest cost per foot and maximum dependability*... proved in job after job, on all types of cutting! Blade types for every condition.

SPECIFICATION CHART

Blade No.	Recommended application
FCW-101	For hard, dense, well cured concrete
FCW-103	For maximum life in hard, dense, well cured concrete
FCB-303	For asphalt and soft aggregate green concrete
FCG-201	For 8 to 36 hour green and extra hard abrasive concrete
FCG-204	For maximum life in green and extra hard abrasive concrete



FELKER ABRASIVE WHEELS

A complete line of Abrasive Wheels for cutting green concrete, wherever adaptable. Now available from your Felker Distributor—ask for information!

World's Largest and Oldest Manufacturer of Diamond Abrasive Cut-Off Wheels and Machines"

FELKER MANUFACTURING CO.

TORRANCE • CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 565

All-hydraulic crane is overhead hoist unit

■ A completely hydraulic, 3-ton overhead traveling crane, believed to be the first ever built, has been designed and constructed as an experimental model by the Shaw-Box Crane & Hoist Division of Manning, Maxwell & Moore, Inc. The new machine is expected to have application as a lifting unit in large contractors' and dealers' repair and maintenance shops.

Advantages of the crane pointed out by the manufacturer are that it provides infinite variable speed under any load and requires far less maintenance than its multimotored electric counterpart. Additionally, it is estimated that the cost of the all-hydraulic crane will be approximately 10 per cent less than comparable three-motored cranes.

Power for each of the crane motions—hoist, trolley travel, and bridge travel—is supplied by a single Dudco constant-delivery, vane-type, hydraulic pump driven by a 10-hp squirrel-cage-type, single-speed motor. The pump has a capacity of 12 gpm and provides 2,000 psi at 1,200 rpm.

Present full-load speeds for the crane are 175 feet per minute for the bridge, 100 feet per minute for the trolley, and 18 feet per minute for the hoist.

For further information write to the Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc., Muskegon, Mich., or use the Request Card at page 18. Circle No. 113.

Metal-cutting tools

■ The accurate Porter cutter to use in cutting or splicing metal and steel parts is the subject of a catalog from the company. Bolts, rods, wires, cables, chains, nuts, and steel strap-pings are the parts shown, along with the correct Porter tool to use. Cutting instructions are given. The remainder of the catalog pictures special tool applications for holding, locking, shaping, and joining.

To obtain Catalog No. 655 write to H. K. Porter, Inc., 74 Foley St., Somerville 43, Mass., or use the Request Card at page 18. Circle No. 49.



One man positions, operates, and moves crawler track drills

A half-dozen recently developed track drills are setting the pace for work on a 5-mile stretch of the new Connecticut Turnpike near Milford, Conn., making earthwork an efficient first phase of construction on this \$8 million project.

Each drill, sinking 2½-inch holes at an average rate of 500 feet in a 10-hour day, is mounted on a pair of air-operated crawler tracks that can be individually operated through two separate controls. Even though three shovels keep busy moving blasted rock and earth at a rate of more than 8,000 cubic yards per day, drilling and blasting crews are still removing needed material for fills faster than dump trucks can haul it away. Lizza & Sons, Inc., Oyster Bay, N. Y., which started the work earlier this year, hopes to reach a production figure of 15,000 yards per 10-hour day by putting additional hauling units on the job.

Altogether, two million cubic yards of fill are needed. Aside from the rock excavation, a million yards is borrow and 500,000 cubic yards will come from the roadway excavation. The highest fill on the project is 35 feet.

Drills move fast

Two men operate the six Chicago Pneumatic air drills, but only one man is needed to move and position a drill. Though only one Chicago Pneumatic 600 Power Vane air compressor is needed to power the six drills, Lizza is using two compressors, each one working with three of the drills.

Holes, 2½ inches in diameter and spaced approximately on 6-foot centers, are being put down to full depth with 20-foot-long drill steel equipped with detachable Ingersoll-Rand carbide insert bits. This small drill pattern is being used so that rock will be broken into sizes small enough to be used directly on the fills. Sometimes, the flint-like rock cleaves along planes of weakness so that irregular sizes of rock are blasted loose. But a shovel working into an 18-foot-high bank can chip and break these pieces, then load them into trucks hauling directly to fill areas. The only secondary drilling required is in the largest rock cut on the entire project. This work on the 30-foot deep cut is being handled by Chicago Pneumatic wagon drills.

Holes are being loaded with 25



Two of the newly-developed Chicago Pneumatic track drills sink holes in the flint-like granite to be used for fill material on the turnpike. The Chicago Pneumatic Power Vane 600 air compressor, back-ground, powers the drill.

C&E Staff Photo

Air-operated drills have individual controls for tracks; contractor aims at moving 15,000 cubic yards of rock daily



This shovel is so big

It scoops up 90 tons of overburden in one bite

◀ **THE MOUNTAINEER**, "world's largest shovel," built by Marion Power Shovel Company for Hanna Coal Company Division of Pittsburgh Consolidation Coal Company.

CHAMPION WEIGHT LIFTERS. It takes only two 2½-inch Tiger Brand hoist ropes to transform the power of this huge machine into useful work. The boom is supported by four 3½-inch Tiger Brand Bridge Strands.



pounds of dynamite, which produce approximately one cubic yard of rock per pound of explosive. The 25-pound charge consists of 9 pounds of American Cyanamid 40 per cent gelatin and 16 pounds of American Cyanamid 44 dynamite. Any holes between 10 and 20 feet deep are loaded with at least three sticks of 40 per cent gelatin. Each 3-pound stick is 16 inches long and 2 inches in diameter.

The number of delays used increases progressively in rows put down further and further from the open face of the cut. In this way, a path of least resistance is provided for the rear rows of drill holes so that maximum fragmentation is achieved. A Du Pont hand-blasting machine sets off the charge after the holes have been loaded, backfilled, and tamped.

Moving rock and earth

Earth is being loaded out to about ten Mack 10-yard rear-dump trucks by three shovels: a Link-Belt Speeder, powered by a Caterpillar V-8 diesel and equipped with an Amsco 2½-yard bucket; a Lorain 820 with an Amsco 2-yard bucket; and a Northwest 80-D with a 2½-yard bucket. Right now, this spread is handling about 8,000 cubic yards of material a day, but Lizza expects to almost double this rate when seven LeTourneau-Westinghouse Model B rear-dump rock wagons are put on the job.

A large quantity of the excavated rock was used in a mile-long section of the roadway that runs through a swamp. After a Manitowoc dragline removed the muck—sometimes going to a depth of more than 15 feet with

Each drill, equipped with detachable 2½-inch carbide-inset bits at the end of 20-foot drill steel, puts down about 500 linear feet of 2½-inch hole in a 10-hour day.

C&E Staff Photo



its 3-yard bucket, the area was back-filled with rock. An Allis-Chalmers HD-21 tractor pushed the material into place as it was hauled in by truck.

Elsewhere on the fill areas, four Caterpillar D8 tractors do rough grading as excavated rock and earth is delivered. Three Caterpillar scrapers, pulled by Cat D8's, are being used for the roadway earth excavation. Excavation for the 14,000 linear feet of concrete drainage pipe is being handled by a Lorain ½-yard backhoe. This roadway grading is being done on a strip about 300 feet wide to accommodate the six-lane divided roadway of the turnpike.

Equipment maintenance

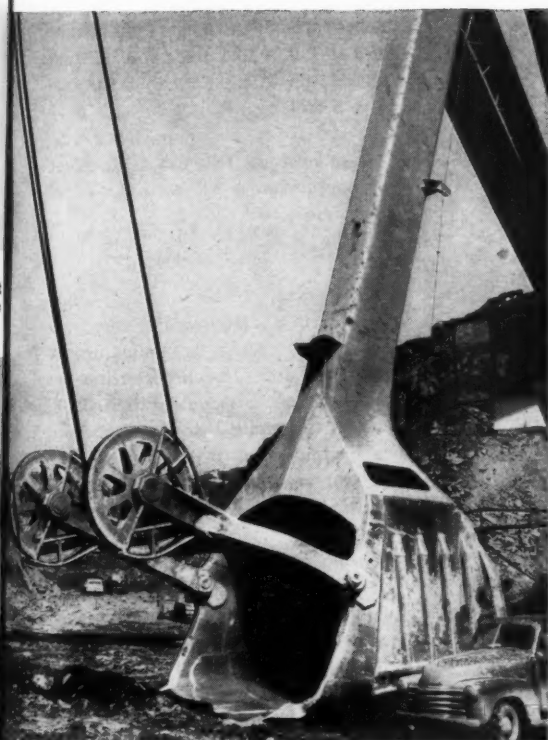
With all this equipment constantly on the move, Lizza's master mechanic works hard and fast to prevent major breakdowns on the job. Field lubrication is being done with a Lubrovan mounted on an Army-surplus truck. Five Lincoln reels furnish motor oil, transmission oil, chassis lubrication, track lubrication, and air to the working equipment. Air is supplied by a Champion air compressor, driven by a Wisconsin engine, which is mounted on the truck. Every 80 to 100 hours of operation, oil and oil filters are changed on the equipment. This schedule permits the master mechanic to work on half the equipment one week and the other half the following week.

Tire repairs are handled on the job by a Goodyear service truck. Damaged tires, taken off equipment in the field, are replaced with a spare by a Goodyear representative. The damaged tire is then brought to Goodyear headquarters for repair. This service is cutting excessive downtime, permitting rubber-tire equipment to keep rolling constantly.

Two other trucks are used by the maintenance section for field repairs. One is a welding truck with a Hobart 200-amp welding machine mounted on the truck body, the other is a 700-gallon fuel truck. All Atlantic products used on this job are stored in tanks located in the maintenance yard.

Work with all this maintenance equipment is coordinated by 12 RCA mobile two-way radios, installed in the superintendents' pickups and cars to allow the field office to communi-

soig you can't believe your eyes



THE BIG DIPPER can scoop up 60 cubic yards of overburden, deposit it 290 feet away in piles 100 feet high. Tiger Brand Wire Rope provides the steel "muscles" that make it work.



You have to look at this shovel with your imagination—for your eyes will surely deceive you. The tip of the boom, for example, rises up as high as a 16-story building. The shovel has the power to lift a platform containing 166 1½-ton automobiles 100 feet into the air, swing them the length of a football field, set them down on top of a 10-story building, and swing back for another load . . . all this in 45 seconds!

The tremendous power of the shovel is transmitted to the dipper through two 2½-inch American Tiger Brand Wire Ropes, each 580 feet long. The huge boom, which towers 160 feet, is supported by four 115-foot lengths of 3½-inch diameter Tiger Brand Galvanized Bridge Strand. Each strand has a breaking strength of approximately 800 tons, for a total of 3200 tons.

In addition to the main hoist ropes and boom supports, the three-man elevator shuttles up and down on standard Tiger Brand Elevator Wire Rope.

The fact that all of the wire rope applications on this "world's largest shovel" are being handled by standard Tiger Brand constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope. No matter how big and exacting the job, you can get a Tiger Brand Rope to fit your needs.

AMERICAN STEEL & WIRE DIVISION

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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
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UNITED STATES STEEL EXPORT COMPANY, N.Y. YORK

USS AMERICAN TIGER BRAND WIRE ROPE



Excellay Reformed

UNITED STATES STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 566



A Lorain 820 shovel with Amsco 2-yard bucket—one of three shovels on the spread—loads broken rock out to a Mack 10-yard rear-dump truck hauling to a swamp area that has already been mucked out.

C&E Staff Photo

NOW—Make your "CAT" a 3-Way Profit-Maker with an



ROCK RIPPER

for Caterpillar
D9, D8, D7 and D6 Tractors

1. Turn Former "Shoot & Shovel" Jobs Into Extra-Profitable Scraper Operations... tractor mounted design applies tractor weight *plus* ripper weight to points for fast penetration in hardest materials. Exclusive curved shank produces underground "quiver" that makes rock-splitting points act like jack-hammers to split and shatter rock into easy-loading condition, fast. Result? You can scraper-load many materials you'd otherwise have to "shoot and shovel"—at handsome savings in cost!



2. Get Extra-Yardage Loads Faster, With Less Scraper Wear & Tear... rock jobs aren't the only ones where ATECO rippers pay off. Whenever you hit cemented gravel, clay, mixed rock and dirt, packed or other hard-to-load materials, a few passes with an ATECO ripper will give you heaped scraper loads in a hurry, save you plenty on scraper downtime and repair!

SPEEDS TREE FELLING, LAND CLEARING, TOO! Root knives available to cut 12" roots in a single pass—a few passes to cut supporting roots, a push with dozer or stinger, and even biggest trees go down in seconds!



3. Increase Tractor Work-Power... with an ATECO ripper behind and a dozer in front, your "CAT" is complete master of the cut—ready to rip, bulldoze or push-load, instantly. Ripper weight balances dozer, adds traction, improves handling. Tractor-mounted ripper works wherever the tractor can go, turns in its own length!

Why not get all the workpower you pay for out of your "Cat"? Make it a 3-way profit-maker with an ATECO ripper! See your Caterpillar distributor today to arrange a demonstration on your job, or write us now for literature and specifications.

35

ATECO EARTHMOVING EQUIPMENT

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Available From Eastern Warehouse Stocks

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BULLDOZERS • ROADBUILDERS • SCRAPERS • TAMPERS • RIPPERS • FARM IMPLEMENTS • FRONT LOADERS • HYDRAULIC PUMP • TANK & VALVE ASSEMBLIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 371

(Continued from preceding page)

cate with the home office in Oyster Bay, Long Island. The master mechanic has an RCA set in his pickup so that he can intercept a distress call from operators with equipment needing repairs.

Roadway work

The project, scheduled to be finished in February, 1958, will have a 2-foot-thick subbase of select material in places where the roadway passes through a rock cut. A 12-inch-thick subbase course will be put down in areas of earth cuts, and a 6-inch thickness will be put down on top of fill areas.

The roadway will consist of six 12-foot-wide reinforced-concrete lanes, separated by a depressed grass median about 38 feet wide, and having outside shoulders 10 feet wide. Each outside roadway lane will be 10 inches thick; the remaining inside lanes will be 9 inches thick. Shoulders will consist of a 7½-inch compacted gravel base topped with a 1¼-inch asphaltic binder course and a 1¼-inch asphaltic-concrete wearing surface. Side slopes of the roadway will vary. Slopes through rock cuts will be 1 to 2, and slopes through earth cuts a maximum of 2 to 1. A 4 to 1 slope will be used for fills up to 4 feet, 6 to 1 for fills 4 to 8 feet, and 2 to 1 for fills over 8 feet. Concrete for the paving will be furnished by an Erie batch plant set up approximately at the midpoint of the project.

Personnel

Elia Lizza, president of the company, is in direct charge of the project. He has John J. Rogers as project manager and Joseph Sciortino as general superintendent. Harold Cook, master mechanic, has five mechanics in his shop. This 5-mile project was actually awarded under two separate contracts covering two adjacent sections of the turnpike. As a result, two consulting engineering organizations are working on Lizza's project: Fay, Spofford & Thorndike, Boston, Mass.; and Charles H. Sells, Pleasantville, N. Y. The \$398,000,000 pike is being built by the Connecticut State Highway Department, which has Newman E. Argraves as commissioner.

THE END

Overhead cranes

■ A 40-page catalog from Dominion Bridge Co., Ltd., covers a line of electric overhead traveling cranes and other handling equipment. Light-duty and general-service cranes for maintenance shops and bucket cranes for aggregate-producing setups are treated. Also included is information on electrical equipment, accessories, buckets, special-purpose cranes, and other types of handling equipment. Data is given on runway design and typical applications of overhead cranes.

To obtain Catalog No. M-100 write to Dominion Bridge Co., Ltd., Lachine, Province of Quebec, Canada, or use the Request Card at page 18. Circle No. 35.

CONTRACTORS AND ENGINEERS

Cost of federal-aid roads at its highest since 1952

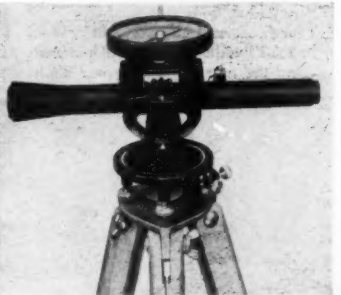
The cost of building federal-aid highways went up 1 per cent in the first three months of this year, coming to 132.4 in the U. S. Bureau of Public Roads price index. This is 1.3 per cent above the 131.1 figure for the last quarter of 1955, but 3.1 per cent below the average for the peak year, 1952.

The bureau uses 1946 as the base year for the index. This is the year when the average prices for various classes of work was taken to represent an index of 100, common excavation accounting for 30 per cent of the work; paving, 48 per cent; reinforcing steel, 6 per cent; structural steel, 3 per cent; and structural concrete, 13 per cent.

The tabulation above, starting with 1930, shows the standing of the annual index values when significant shifts were made in the price trend, together with quarterly values for last year and the first quarter of this year.

Introduce transit-level for construction work

A new Service transit-level with an internal-focusing telescope for easier sighting and more accurate leveling



The new Berger Service transit-level with internal focusing telescope and detachable compass.

in construction work has been introduced by C. L. Berger & Sons, Inc.

Fixed crosshairs in the eyepiece of the 10-power erecting telescope simplify focusing in setting batter boards for small buildings, drainage work, aligning stone walls, and similar building applications. The telescope is a one-piece casting with rack and pinion adjustment, and is sealed against dust.

A 20-mm-diameter achromatic objective lens and precision-ground, sensitive telescope vial assure a good image and smooth leveling. The instrument is converted from a transit to a level by means of a telescope lock.

For further information write to C. L. Berger & Sons, Inc., 37 Williams St., Boston 19, Mass., or use the Request Card at page 18. Circle No. 72.

Yellowstone Park resort

Construction starts this month on a 10-year building program for Canyon Village in Yellowstone National Park. McNeil Construction Co., Los Angeles, Calif., is the contractor for the administration building, lodge, recreation hall, two dormitories, and 300 motel units that will be built under the first phase of the program.

ANNUAL INDEX FIGURES

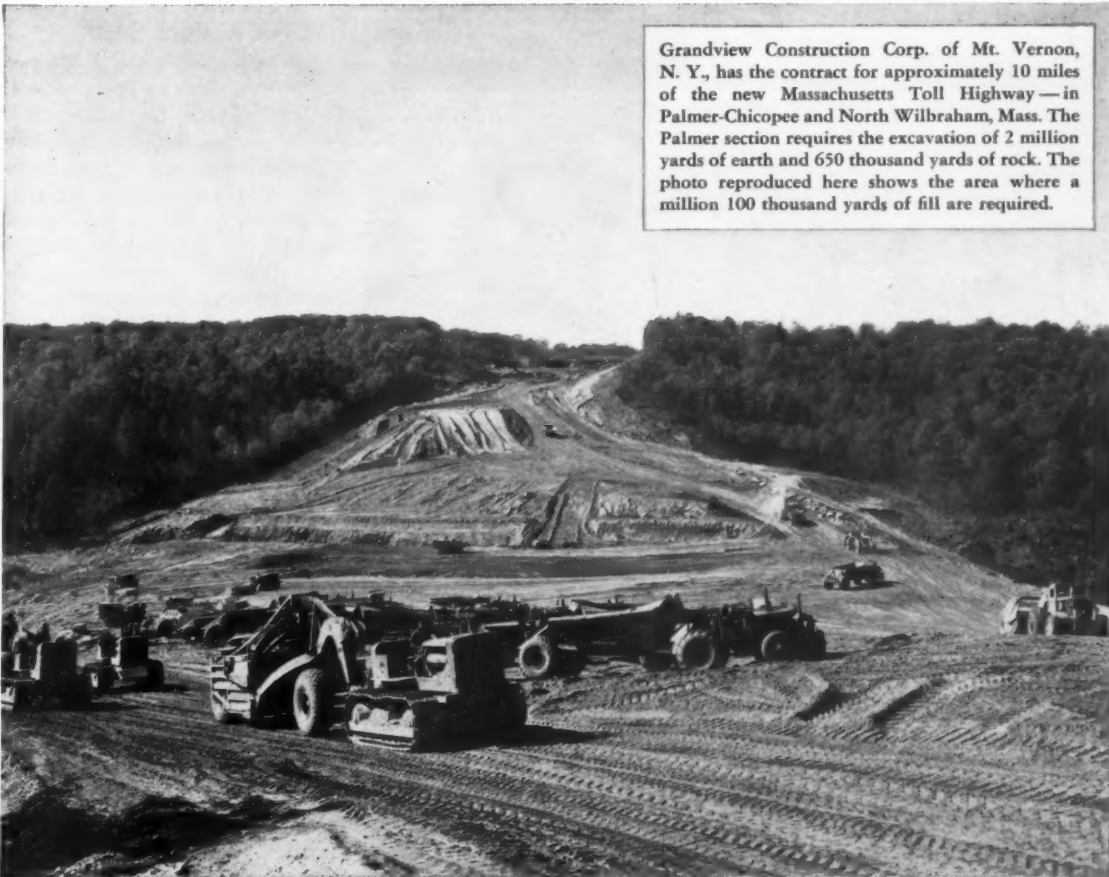
Year	Common excavation	Pave-ment	Structures			Total struc-tures	Com-pos-ite mile
			Rein-forcing steel	Struc-tural steel	Struc-tural concrete		
1930	87.1	70.2	60.0	54.0	51.8	54.3	72.0
1932	55.5	54.3	45.3	40.7	39.5	41.3	51.2
1934	84.1	71.7	57.3	46.9	45.7	49.1	70.6
1940	59.7	63.4	60.0	55.8	49.4	53.2	60.2
1943	125.1	102.4	89.3	84.1	77.8	81.6	104.9
1945	102.4	89.9	82.7	68.1	81.5	80.4	91.6
1946	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1948	120.3	127.2	143.7	139.6	131.5	136.0	127.1
1950	95.3	125.4	132.7	123.2	115.0	121.1	115.8
1952	115.2	143.4	166.5	164.3	140.5	150.5	136.6
1954	101.8	136.9	154.9	146.9	131.3	139.6	127.1
1955: 1st qtr	102.0	138.5	151.1	138.7	131.8	138.0	127.6
2nd qtr	101.1	135.8	150.3	134.2	129.1	135.6	125.5
3rd qtr	103.2	138.9	157.5	146.0	137.8	144.3	129.4
4th qtr	104.6	140.0	163.0	164.6	137.3	147.5	131.1
Average	102.7	138.3	155.5	145.9	134.0	141.4	128.4
1956: 1st qtr	105.7	141.9	166.1	169.1	135.1	147.6	132.4

Ditching machine

The Owen-Pewthers hydraulically operated Earthripper is highlighted in a folder from the firm. The unit can dig to depths of 8 feet and to widths of 30 inches. The conveyor, reversing at the touch of a valve to discharge spoil on either side, has variable belt speeds up to 750 feet per minute. Job photos point out such features of the unit as one-man operation, self leveling, and the ability to dig at any angle. Parts shown are the demountable mud pads and the open-roller conveyor belt. Operating data is included.

To obtain the folder write to Owen-Pewthers Mfg. Co., P. O. Box 540, College Station, Texas, or use the Request Card that is bound in at page 18. Circle No. 24.

GULF PRODUCTS and FINE SERVICE keep equipment rolling on Massachusetts Toll Highway Project



Grandview Construction Corp. of Mt. Vernon, N. Y., has the contract for approximately 10 miles of the new Massachusetts Toll Highway—in Palmer-Chicopee and North Wilbraham, Mass. The Palmer section requires the excavation of 2 million yards of earth and 650 thousand yards of rock. The photo reproduced here shows the area where a million 100 thousand yards of fill are required.

LIKE other leading contractors, Grandview Construction Corp. is mighty careful about controllable costs, particularly maintenance expense. And that's an important reason why the Grandview Construction people selected Gulf as their supplier of petroleum products on the Massachusetts Toll Highway Project. They have found that Gulf quality lubricants keep their maintenance costs at rock bottom levels... and they appreciate Gulf's prompt delivery service and helpful petroleum engineering counsel.

Send the coupon for your copy of our new brochure, "Gulf and Your Business."



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Gentlemen:
Please send me a copy of your new brochure, "Gulf and Your Business."

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Company.....
Title.....
Address.....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 372

An all-time record of 61,132,000 persons made use of recreation facilities at civil works projects of the U. S. Army Corps of Engineers during 1955. Previous records were 53,848,000 in

1954, and 41,301,000 in 1953. Much of the increased use of the facilities is credited to the park and recreation programs undertaken on reservoir areas by counties and cities.

Stone and Granular Materials

SINGLE-COURSE COMPACTION

18% Faster to Required Densities

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Improved shoe design with greater vibrating energy gives you even faster single-course compaction . . . and one machine handles the widest variety of sub-base materials you are likely to encounter.

Use Vibro-Tamper in '56 for new profits . . . by eliminating multiple lift work and the high cost of backtracking, stockpiling and rehandling materials.

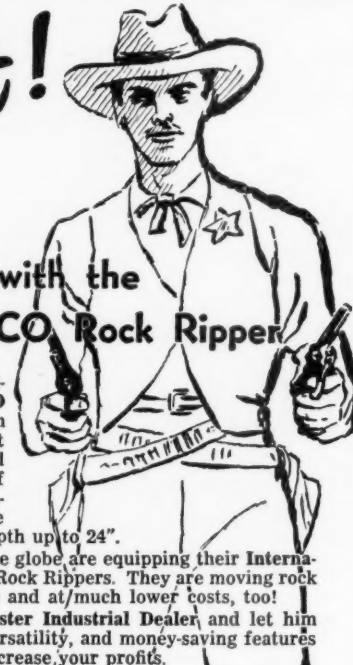


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For more facts, use Reader-Reply Card opposite page 18 and circle No. 373


Don't Shoot! Rip . . . with the ATECO Rock Ripper



Tremendous penetration and shattering action is obtained by ATECO design which features prying action provided by curved shanks to lift and break rock or pry out imbedded boulders. The natural draft of curved-tapered shanks plus controlled hydraulic down pressure keeps the points at any desired depth up to 24".

Contractors in every part of the globe are equipping their International TD-24 tractors with ATECO Rock Rippers. They are moving rock faster and easier than ever before and at much lower costs, too!

See your International Harvester Industrial Dealer and let him show you how the "live action," versatility, and money-saving features of the ATECO Rock Ripper will increase your profits.



ATECO

GREENVILLE STEEL CAR COMPANY
(SUBSIDIARY OF THE PITTSBURGH FORGINGS COMPANY)
GREENVILLE, PENNSYLVANIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 374

Standard Construction Co., Inc., Minneapolis, uses two Prime Movers to haul ready-mix concrete to first-floor pours. ▼



Case history

Concrete placed quickly by means of power carts

Commenting on the Bell Prime Mover, Clarence Westmark, a project superintendent for the Standard Construction Co., Inc., Minneapolis, Minn., recently said: "We're completely sold on using these power buggies for every possible kind of construction handling, and we set up our jobs with this in mind. Our men like to use the machines, and they get more work done with them."

Westmark handled the building of the Bethesda Hospital Nurses' Home, St. Paul, Minn., for the Standard firm. On the ground level, he used two Prime Movers to haul concrete direct from the ready-mix truck to the pour. For pouring the lower walls, a ramp-way with a grade of about 20 per cent was built and the two power buggies took the concrete along this route.

In this manner, Westmark was able to count on pouring about 40 yards per hour with the Prime Movers.

The Standard organization has several other Prime Movers on the Bethesda job. Two of them are equipped with platforms and are used for hauling brick tile, lumber, and other materials.

For further information on these power buggies write to The Prime Mover Co., Muscatine, Iowa, or use the Request Card at page 18. Circle No. 187.

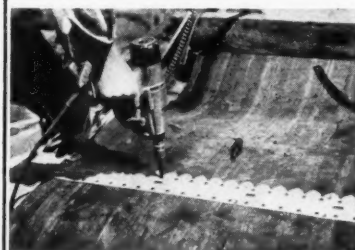
Power brush

■ Eleven 1½-inch-wide wire brushes combined on the arbor of specially-designed trollies are said to clean structural steel efficiently and quickly, according to a folder from the manufacturer, Independent Iron Works, Inc. At each inversion brush bristles are automatically resharpened. Job photos show one man cleaning the inside flanges and webs of T-bars and wide-flange beams. The folder states that one man can clean 17 tons of steel with inside flanges and T-bar webs or 150 tons of wide-flange beams in one day. The brush is powered by a Westinghouse reversible 3-hp motor with sealed bearings.

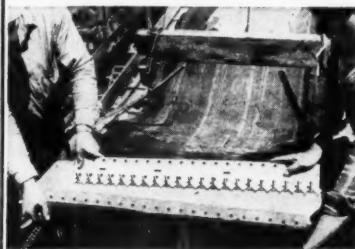
To obtain this folder write to Independent Iron Works, Inc., Eighth and Pine Streets, Oakland 7, Calif., or use the Request Card at page 18. Circle No. 20.

NEW FLEXCO SPEED TOOLS CUT APPLICATION TIME IN HALF

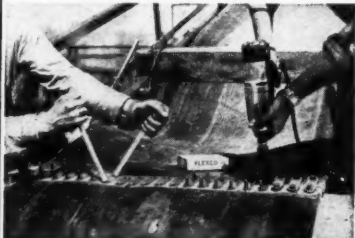
Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.



The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



Running down nuts is fast with the new FLEXCO Speed Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Speed Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

FLEXIBLE STEEL LACING CO.
4608 Lexington Street • Chicago 44, Illinois

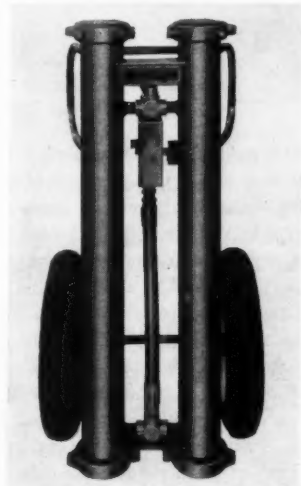
For more facts, circle No. 375

CONTRACTORS AND ENGINEERS

On-the-spot filtration with wheel-mounted unit

■ On-the-spot filtration for all hydraulic systems and machines is possible with the Filter Buggy, manufactured by Schroeder Bros. The unit comes mounted on either pneumatic or solid rubber tires, and uses power from the hydraulic machine it is filtering. It is also available with a mounted pump and motor.

A phenolic-resin-impregnated cellulose filter with radial fins provides a filter area of 13,944 square inches. The



manufacturer states the filter will remove particles smaller than white blood cells, but will not filter out oil additives or chemical or water-base flame-resistant fluids.

Filtering time is governed by the gpm rate of the pump and the amount of oil in the machine reservoir. Relief valves with a maximum pressure differential of 40 psi protect the filter elements.

For further information, write to Schroeder Bros., 3116 Penn Ave., Pittsburgh 1, Pa., or use the Request Card at page 18. Circle No. 52.

Redesigned sump pumps offer wide selection

■ The redesigned line of Deming sump pumps permits selection of a pump for particular capacity and head requirements regardless of sump depth. The pumps are available for sump depths of from 2 to 11 feet in 1-foot multiples for any pumping requirement.

Standard single units include pump, support plate, motor (in sizes ranging from ½ to 75 horsepower), and control. A four-piece liquid end assembly aids in servicing and maintenance. An axial shaft adjustment allows regulation of capacity and head, and adjustment for impeller wear. Pumps range in discharge sizes from 1½ to 6 inches, with capacities to 1,000 gpm and heads to 75 feet.

Duplex models consist of two single pumps driven by separate motors and controlled by an alternator switch. Construction is the same as on single units except for the cover plate, which accommodates two units instead of one.

For further information write to The Deming Co., Salem, Ohio, or use the Request Card at page 18. Circle No. 75.

Case history: This unusual assembly of Universal scaffolding, used by Consolidated Builders, Inc., as shoring on a Massachusetts Turnpike bridge job, saved on both time and expense. The space between the frames was reduced to 2 feet. Universal Gravity-Lock assemblies were welded to stringers fabricated from steel angle, the assemblies replacing standard bracing in attaching the stringers to the main scaffolding. The scaffolding was then wedged against the piers of the bridge, thus eliminating the need for great amounts of sway bracing. For more information on Universal scaffolding write to the **Universal Mfg. Corp.**, 133 North St., Zelienople, Pa., or use the Request Card at page 18. Circle No. 210.



Fights Deposits!

SINCLAIR

SUPER TENOL MOTOR OIL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 376

Keep out power-robbing deposits in your heavy duty Diesels. Refill with Sinclair SUPER TENOL® for the tough jobs! It helps to eliminate deposits of carbon, varnish and sludge that impair engine efficiency. SUPER TENOL is specially engineered to fight the effects of high temperature, engine over-load and continuous stop-and-go operation. Your engines last longer!

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



Progress in sawed contraction joints

This Vibro-Joint machine lowers a vibrating bar into the slab to part the aggregate where a joint is to be sawed, increasing the life of the blade.



"...started with a rented CLEVELAND in 1949 ...now we own ten"

SO SAYS HUBERT S. ELEY, vice president and general superintendent of D. A. Foster Trenching Corp., of Merrifield, Va. Today the firm, employing about 200 men in the field, keeps its 10 Cleverlands (Models 95, 110 and 140), constantly busy on trenching jobs of all kinds. Further excerpts from Mr. Eley's report:

"...we encounter all types of soils and terrain... swamps, sand, rock, shale, clay... stumps, boulders and other obstructions... hill and flatland... our Cleverlands dig them all."

"...we dig a gas or water house-connection in 15-20 minutes with one of our Cleverlands."

"...on building footings we dig 1,800-2,000 feet of 30" deep trench per day with a Cleveland."

"...not necessary to stockpile large amounts of parts for Cleverlands."

"...fuel costs not a significant factor... our

Cleverlands operate a working week on a tank of fuel."

"...our Cleveland 140 paid for itself within 30 days."

"...one of the many reasons we prefer Cleverlands is their all-around adaptability... besides our utilities work and footings contracts we use them for drainage trenching, septic tank installations and a wide range of other applications."

"...we consider Cleverlands the best all-purpose trenchers made... the easiest to operate... and the longest lasting."

Joint sawing has been gaining acceptance steadily as a result of improved equipment and the accumulation of experience with the technique. The practice improves concrete-road construction in a number of ways.

The smooth narrow cut made by a joint saw has little effect on the smoothness of the concrete roadway, and it increases the durability of the pavement. There is far less spalling and chipping at the joints. The amount of seal used is not enough to disturb the riding quality of the pavement, even when the seal expands. The repeated impact and vibration imparted to the pavement by each passing vehicle is eliminated when joints are sawed. And the narrow cut made makes it less possible for water and other foreign matter to get into the joint.

The cost factor

One of the reasons for the shift toward sawing contraction joints lies in the fact that a constant effort is being made to reduce the comparatively high cost of making joints by this method. Hand-formed joints may add about 12 to 18 cents to the cost of paving a linear foot of concrete roadway, while the cost of sawed joints, according to the U. S. Bureau of Public Roads, runs from 3 to 85 cents per linear foot. The factors that influence the cost of sawing are those which bear on blade life—the type of aggregate used in the concrete, the depth of the cut, the condition of the concrete while sawing is done, the type of equipment used, and the skill of the operator.

The major consideration in profitable sawing is the high purchase price of the blade. A small diamond blade, 10 inches in diameter and 7/64-inch thick, costs just under \$90. The 12-inch-diameter, 1/8-inch-thick blade, more commonly used, costs \$135; it is used to cut well-cured concrete. A similar size blade costs \$155; but this type is suitable for cutting the very abrasive 6 to 12-hour-old green concrete.

One answer to blade cost is the abrasive disk, reinforced with wire mesh, which uses carborundum or some other hard abrasive as a cutting edge. Selling for as little as one-tenth the price of the diamond blade, it has proved more economical in cutting concrete with softer aggregates.



THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue

Cleveland 17, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 377

by FRANK KYPREOS,
Research Director

**More states use or experiment with
method as experience and improved saws
help overcome problems**



The Clipper Model C-360 ConSawMatic, a self-propelled rig capable of moving up to 26 feet per minute, is used on a new Kansas highway near Seneca. This rig can be shifted quickly from transverse work to longitudinal work on joints.

These blades have also helped to solve another sawing problem by making it economical to saw concrete at the optimum time. While, generally speaking, sawing is done 4 to 24 hours after concrete has been placed, just when it should be done depends on experiences in a given area with both the concrete mix and random cracking in the slab. Weather conditions, the rate of curing, the type of aggregate used, and the mix, all influence the time at which contraction stresses will be severe enough to crack the slab. Often, this cracking will not take place until sawing has been started, and a crack running from the saw blade to the far edge of the slab will appear unexpectedly, especially if sawing is done during the cool part of the day.

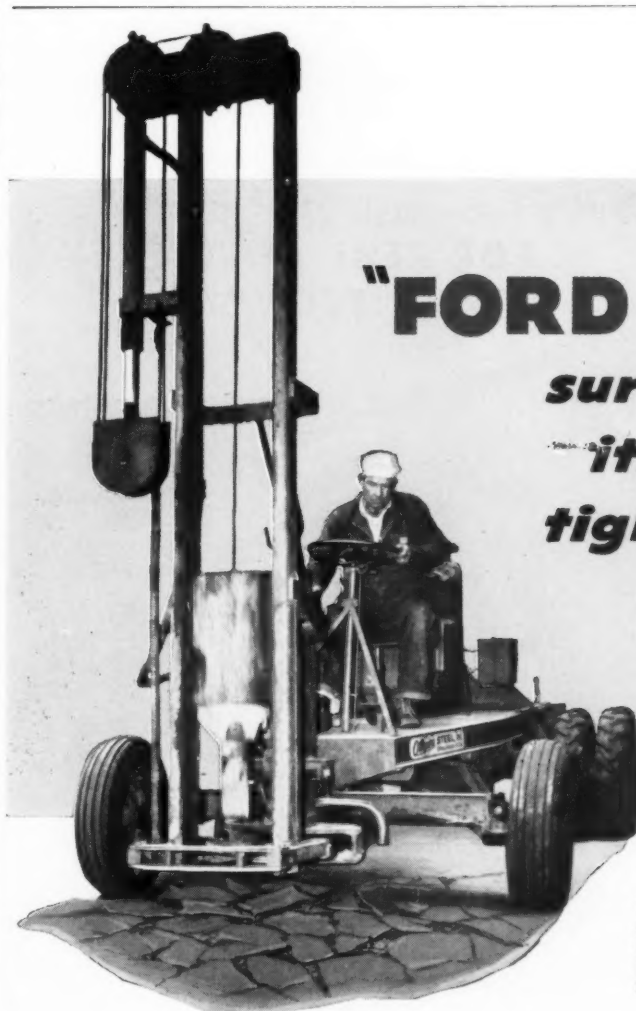
The obvious solution to this problem is to saw joints early. But green concrete wears diamond blades down so fast that the per-foot cost of sawing is high. This cost has been reduced by blades with special bonds that retain the diamond particles; but abrasive disks, nevertheless, do this work more economically because of the price factor.

Other problems

Cracking still remains a problem, however, and various means have been developed to check it, depending on how and when it occurs in various areas. In some sections of the country, control joints are formed or sawed early at wide intervals, and intermediate joints are sawed later. Abrasive blades are often used for the early cuts, and diamond blades for intermediate cuts. Carborundum blades sometimes do both of these jobs in concrete that contains softer aggregates.

The time of day is the critical factor in sawing work in some states. Since concrete placed in the morning contracts during the day and cracks during the night, it has been found better to saw the slab early, regardless of the effect on the life of the blade. Initial stresses develop more slowly in concrete placed during the afternoon, and cracking will not usually occur until the following night. In any case, the rate at which concrete hardens is the factor considered in determining when sawing should be done.

(Continued on next page)



**"FORD POWER
sure proves
its worth on
tight schedules!"**

says Mr. E. Chilquist, Const. Supt.
Alex Robertson Co., Walnut Creek, Calif.



"We've relied on Ford Power to help us meet tough deadlines for twenty years now. First, because Ford Engines give us dependable performance under all kinds of operating conditions . . . second, when we need service we get it—fast!"

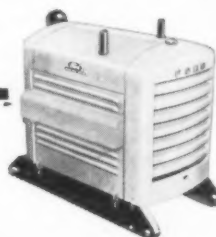
The Alex Robertson Co. is currently replacing underground steam and condensate lines at the Mare Island Naval Shipyard. And what a job it is! To reach the old lines, eighteen inches of concrete and asphalt must first be torn out. When the new lines have been laid, fill must hit 90 to 95% compaction.

Playing the vital role on this project is a Ford-powered Ottawa Hydra-Hammer. This one-man gang breaks up cement and rips through asphalt with unbelieving ease . . . cuts a four-foot swath *without* maneuvering the wheels . . . and creeps at an infinite number of speeds to meet changing working conditions.

Why is the Ottawa Hydra-Hammer Ford-powered? Let the Ottawa Steel Division of L. A. Young Spring & Wire Corporation tell you: "For some time past we have had an insistent demand for Hydra-Hammers equipped with water-

cooled engines. After many tests it was determined that the Ford "134" Power Unit would give the best performance, cost less and be the easiest to service of all water-cooled power units."

Specify Ford Power for *your* next piece of equipment. You'll find that Ford can serve you better. Especially since a network of newly-appointed Ford Industrial Products Dealers has recently been set up across the nation. Now there's a Ford Industrial Power Headquarters right in your own area. Drop us a line for complete information.



INDUSTRIAL ENGINE DEPARTMENT

FORD Division of FORD MOTOR COMPANY • P.O. BOX 598, DEARBORN, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 378

(Continued from preceding page)

Increased use of sawing

The early work on Kansas and California highways encouraged the use of sawed joints to such an extent that they have been adopted in every region of the country. By 1954, 13 states required that joints be sawed, and 8 states permitted use of the technique with reservations. The method has gained even wider acceptance in the past two years, and to gage the trend, CONTRACTORS & ENGINEERS polled the 48 State Highway Departments and found that today, 19 states require joints to be sawed, 6 make it optional with the contractor under specified conditions, and 6 more are experimenting with the procedure. The state of Washington is observing rather



A 16-blade Cutcrete saw, mounted on rubber tires, saws a 25 or 12-foot joint in 1½ minutes. Multiblade saws like this have been used often in turnpike construction.

than experimenting with sawed joints. Fifteen states do not include joint sawing in their specifications, and one state, in the process of changing its spec, could not commit itself on the matter.

Among states that require sawed joints are some with the most miles of roadway—California, Colorado, Illinois, Iowa, Kansas, Minnesota, Oklahoma, and Wisconsin. States now experimenting with the method are Arizona, Indiana, Michigan, Mississippi, Texas, and Virginia. Though Michigan is experimenting with sawed contraction joints, it already requires longitudinal joints to be sawed, and reports that this practice is very satisfactory. Indiana is using sawed contraction joints on seven experimental projects, and has tried sawing longitudinal joints on one project. Experiments in Arizona, where day and night temperatures vary widely, are largely concerned with determining the best time for sawing.

KRUPP PNEUMATIC PAVING BREAKERS PNEUMATIC BACKFILL TAMPERS

FOR REAL EFFICIENCY
AND ECONOMY . . .

The BREAKER with the NEW CUSHION VALVE DESIGN

Front head replacement eliminated with replaceablemoil point bushings of highest quality steel for longer life. Optional 1¼" or 1½".

Also available with short front head for use with chain retainer.



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Distributor Inquiries Invited

KRUPP BACKFILL TAMPER

Harder blows at maximum speed, under varying air conditions.



Self-supporting action enables operator to guide the tamper over the job without lifting the tool. Swivel connector permits greater ease in handling air hose.

Status of contraction joint sawing in state highway department specifications according to a 1956 survey by CONTRACTORS and ENGINEERS

Ala.	required
Ariz.	experimental
Ark.	no information
Cal.	required
Colo.	required
Conn.	not in specs.
Del.	not in specs.
Fla.	optional
Ga.	required
Idaho	not in specs.
Ill.	required
Ind.	experimental
Iowa	required
Kan.	required
Ky.	as required
La.	not in specs.
Me.	required
Md.	required
Mass.	required
Mich.	experimental
Minn.	required
Miss.	experimental
Mo.	required
Mont.	as authorized
Neb.	required
Nev.	not in specs.
N. H.	optional
N. J.	not in specs.
N. M.	not in specs.
N. Y.	not in specs.
N. C.	not in specs.
N. D.	required
Ohio	optional
Okla.	required
Ore.	not in specs.
Penn.	not in specs.
R. I.	not in specs.
S. C.	optional
S. D.	required
Tenn.	required
Tex.	experimental
Utah	optional
Vt.	not in specs.
Va.	experimental
Wash.	observing
W. Va.	not in specs.
Wis.	required
Wyo.	not in specs.

While State Highway Departments have turned to the use of sawed joints more and more as a means of getting better highways for their money and contractors have been learning from trial-and-error method how to saw joints, concrete-saw manufacturers have been radically improving their equipment. Polling the manufacturers, CONTRACTORS AND ENGINEERS asked why and how modern design features were developed by each company:

Cutcrete Mfg. Corp.:

The Trail Blade design is the im-

CONTRACTORS AND ENGINEERS

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portant advancement made by this firm toward operating economy and efficiency in small machines. This feature is included in both single and dual-blade saws, including a 25-hp model. The trailing blade not only cuts a straighter, truer line, but also makes it possible to saw more feet of joint, thus decreasing the per-foot sawing cost.

Another improvement is "step-cutting". The first blade cuts to half the total depth, and the second blade saws the remaining depth of the joint. This increases cutting speed 20 to 40 per cent.

Recently introduced are large 8 or 16-blade machines that will saw a joint 12 or 25 feet wide in 1½ minutes. These saws ride on a carriage with four forward and one reverse speed. These saws have a reversing clutch for easy alignment of the joint to be sawed. Mounted on rubber tires, and with a travel speed of 15 mph, these saws can move onto new pavement as soon as concrete is ready to be cut, and they can saw joints on adjoining strips as soon as side forms have been removed.

Clipper Mfg. Co.:

The first commercial Clipper machines had four small wheels with solid rubber tires that made it easy to keep the saw tracking in a straight

line. By pivoting the front axle in the middle, Clipper produced saws that prevented the blade from binding on uneven surfaces. This design, having both axles and shafts rigidly attached to a common frame, has been called "three-point suspension".

A positive screw-blade feed is favored by the manufacturer, since bumping, tilting, and overadjustment—sometimes experienced with a hydraulic feed—are avoided. The screw feed is mounted on the dashboard of the machine so that the operator can maintain a consistent depth of cut by compensating for the diminishing diameter of abrasive blades. Clipper machines also have a patented water-distribution system that applies coolant to both sides of the blade inside the blade guard. Clipper introduced its self-propelled ConSawMatic in 1954, and last year, the firm placed a 36-hp machine on the market, the Model C-360. Self-propelled at speeds up to 26 feet per minute, this unit has the new Retract-A-Turn feature that makes it possible for the operator to shift quickly from making a transverse joint to a longitudinal joint. No lifting or tilting of the machine is in-

involved, since caster wheels take over the load.

Clipper offers twelve different diamond blades designed for cutting green or cured concrete made with any type of aggregate. It also markets the tungsten-carbide diamond blade, which has a longer life. The Clipper Green-Con blade for sawing green concrete, first marketed in 1954, is available in several types today, including one for use in concrete having some hard aggregate.

The Clipper AC-40 sealer unit, designed especially for sawed joints, is a single unit that melts and seals under high pressure.

Felker Mfg. Co.:

This company's line features a machine powered by a Wisconsin 36-hp

(Continued on next page)

The blade on this Felker machine is hydraulically lifted when the operator steps on the pedal.



A rugged answer
to any tough
**6-WHEEL
DRIVE**
problem

Here's a reliable guarantee of a long, useful, profitable life for a hard-working 6 x 6 vehicle—this husky combination:

- a Clark steering-drive axle for the front
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These are true heavy-duty units—amply strong to carry tremendous loads, ruggedly built to deliver torque to the wheels with dependable efficiency.

Always, wherever you find it, this is a "Quality Specification" . . . CLARK AXLES.

Are you constantly studying how to increase efficiency and decrease costs in that vital area between fly-wheel and tires? Talk to Clark: for in that "vital area" is where Clark can help you; a fact well known to a number of leading equipment manufacturers—to their profit.

As a practical Step 1, send for the handy, pocket-size Clark Products book—for a clear idea of why it's "good business to do business with Clark."

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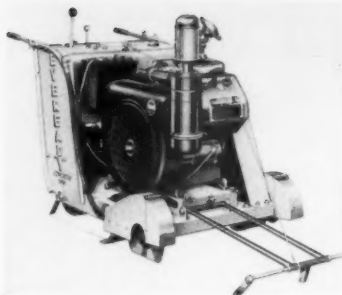


For more facts, use Reader-Reply Card opposite page 18 and circle No. 380

(Continued from preceding page)

engine. A toggle-action hand-clutch control that engages the power-drive mechanism provides positive engagement between the drive and rear wheels to eliminate the chance that the rig will slip or coast on grades.

A second Felker machine, the 25-hp Model 254, is the same as the 364 except for the lower horsepower. Both machines have a hydraulic jack for lifting the blade from the cut, a hydraulic retardant for lowering the blade, and a special clutch control that automatically turns on or shuts off water coolant for the blade. Specially designed collars have a cavity into which coolant is directed. It is ejected under centrifugal force down each side of the blade.



Eveready's 36-hp Model E-36 PD.

Eveready BrickSaw Co.:

Everyready saws, introduced in 1953, have a smooth hydraulic system to lower and raise the diamond blade. The Tri-Matic blade alignment—a type of knee-action front-axle suspension—allows the blade to cut in a

perfect vertical plane, even though the surface of the concrete is uneven. The firm's self-propelled, maneuverable saw travels forward at a consistent pace, so that blade life is extended.

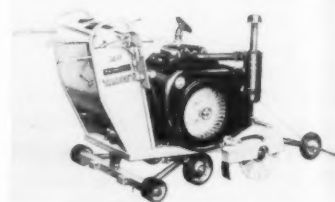
Just announced is the Model E-36 P D, a 36-hp saw that travels at 25 feet per minute at full load. The self-propelled unit is engaged or disengaged by pedals. In operation, this saw is tipped and turned, much like a wheelbarrow. Better weight distribution has been achieved by mounting the motor ahead of the front wheels. This also helps the blade cut concrete using hardest aggregates. Other heavy saws are available with 14.6 and 25-hp engines.

Robert G. Evans Co.:

This company has a 36-hp Model

360 Target Automatic, a self-propelled unit equipped with hydraulic control for raising or lowering the blade. It cuts at speeds from 1 to 35 feet per minute and, though it weighs 900 pounds, can be operated by one man.

A pioneer in abrasive blade manufacture, Evans' Target reinforced



The Target Automatic 360.

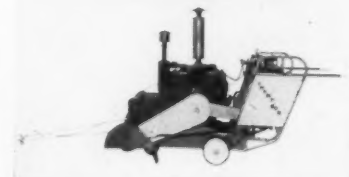
safety blades are now made in thicknesses ranging from $\frac{1}{8}$ to $1\frac{1}{2}$ inches.

Windsor Machinery Corp.:

A 26.8-hp machine that uses a 12 to 20-inch-diameter diamond blade is made by this firm. A special cooling and flushing system, positive depth control, and a hydraulic system that transfers the weight of the machine to the rear wheels with four strokes of the pump so that the machine can be turned easily, are features of this saw. Diamond blades marketed by Windsor, available for all makes of concrete cutters, range from 12 to 22 inches in diameter.

Champion Mfg. Co.:

New 36 and 25-hp self-propelled saws made by Champion feature direct chain drive. A new type of clutch



Champion's new self-propelled saw.

permits the chain-driven rear wheels to operate independently when disengaged. Hydraulic or screw-blade feed is available.

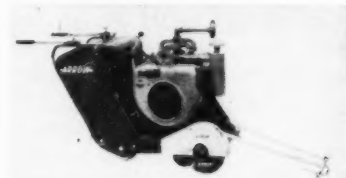
Champion has a new diamond tungsten-carbide bonded blade which, it is claimed, will outwear former blades by 250 per cent. The Con-Flex is made to cut green concrete with limestone, dolomite, or slag aggregates.

Tri-Line Co.:

A rugged tricycle undercarriage that eliminates lateral twisting and tilting which wears down the sides of blades, and a free-wheeling casted front wheel that makes the rig maneuverable are features of the Tri-Line saw. The cutter is raised and lowered by a vertical hydraulic ram operating over the front wheel. Diamond blades made by the firm are 10 to 24-inches in diameter.

M. E. McGrath Co.:

The Arcon 45, a 26-hp unit, is the newest machine in the Arrow line.



The Arcon 45 Arrow cutter.

CONTRACTORS AND ENGINEERS

here's a Wagon Drill that really gets around!

the G-800 TracdriL

- Self-Propelled
- One-man Operated
- Tows Own Compressor

Combine the drilling speed of the hard-hitting CP-70NDC Drifter with the adaptability of a CP Drill Carriage and U-arm... add the maneuverability of a self-propelled track-mounting that tows its own air supply over rough terrain... and you have the One-Man CP TracdriL.

Reversible tramming motors enable the TracdriL to go forward, backward and pivot

... for faster "moving time" from hole-to-hole, more accurate spotting and more time for productive drilling. "Knee-action" tracks keep the hydraulically operated U-arm support level when operating on uneven ground. The TracdriL has plenty of reserve power... can tow a 13,000 pound CP 900 c.f.m. Rotary Compressor up a 10% grade. For details see your CP equipment distributor.



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Self-propelled, it has a 14 or 18-inch blade guard. Both diamond and abrasive blades are available.

Diamond Tool Associates:

This firm has a 14.6-hp saw on the market and is about to introduce a large self-propelled machine. DTA diamond blades feature the C-200 for cutting green concrete, a blade capable of cutting 20 per cent more than earlier diamond blades.

Cardinal Engineering Corp.:

Cardinal, manufacturing both reinforced abrasive and diamond blades, reports that its reinforced abrasive blades have been improved so that they can cut concrete using dense aggregate such as traprock and some gravels. Cardinal is now experimenting with equipment, which, it hopes, will eventually eliminate the need for diamond blades in joint sawing.

Consolidated Diamond Tool Corp.:

The Dia-Tool line includes 12 and 14-inch-diameter tungsten-carbide diamond blades in $\frac{1}{8}$ and $\frac{9}{64}$ -inch segment widths for use on green concrete. It also has 12 to 22-inch blades, with similar widths for use with cured concrete, as well as a line of masonry cutting blades. All can be had in a range of 3 bond hardnesses. The flat-bottomed segment recently developed in this line overcomes undercutting to a large extent, and provides a stronger braze. Improved saw blank materials and designs are still under development by the firm.

Consolidated is also developing a sample test method which may make it possible to estimate the cost of sawing joints in concrete containing various types of aggregates.

The Clyde Co.:

Diamond and abrasive blades in 12- to 24-inch diameters, and in varying widths, are available from Clyde, as well as blades designed for a particular job. The most recent development is the Dual Bond blade featuring a new diamond bond that is fortified to provide a tough cutting edge. Experience to date indicates that the life of this blade is sometimes double that of earlier blades. New diamond blades have also been announced by Serviced Products Corp., Chicago, Ill., and Corrugated Diamond Saw Co., Moonachie, N. J. The Serviced Turnpike blade is made in 12 and 14-inch diameters for old and new concrete. The Corrugated diamond wheel features high spots on the sides of the cutting segments, which are said to increase blade life. A dense tungsten-carbide matrix is used to add abrasive resistance.

Edmar Co.:

Abrasive blades, 12 and 14 inches in diameter and $\frac{1}{8}$ to $\frac{3}{16}$ -inch in thickness are made for three types of cutting—wet cutting of concrete containing hard aggregates, wet cutting of material containing soft aggregates, and dry cutting of material containing soft aggregates. A new abrasive blade offered cuts concrete containing the hardest types of aggregate for half the cost of doing the job with a diamond blade, according to Edmar. Another abrasive blade is made for the dry cutting of concrete that contains soft aggregates.

The companies making or distribut-

ing concrete sawing equipment, blades, and abrasive disks will be glad to supply you with up-to-the-minute facts on their products. Each concern

has been assigned a number, listed below. For further information, on any product, circle the firm's number on the Request Card at page 18.

Company	Circle No.
Cutcrete Mfg. Co., El Monte, Calif.	253
Clipper Mfg. Co., Kansas City 8, Mo.	254
Felker Mfg. Co., Torrance, Calif.	255
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Two new books on marine architecture, engineering

Two new illustrated technical handbooks, "Modern Marine Engineering" and "Modern Naval Architecture", have been published by the Philosophical Library.

Written by D. W. Rudorff, "Modern Marine Engineering" discusses the general aspects of a propulsion plant; turbo-electric propulsion; steam boilers, condensers, and reciprocators; diesel engines and diesel-electric propulsion; and auxiliary equipment.

Recent developments in the field of naval architecture are surveyed in "Modern Naval Architecture", by W. Muckle.

The books, both priced at \$4.75, are available from the Philosophical Library, 15 E. 40th St., New York, N. Y.

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"QUICK-WAY" IS BIG—

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PRECISION BUILT, RUGGED,
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The all new "QUICK-WAY" models are designed to heavy duty specifications—with more BIG SHOVEL FEATURES than any other in the small shovel field—built with more steel and with perfect BUILT-IN balance that guarantees precision control, greater lifting and digging power, longer life and more work per horsepower.



MODEL 105 A 5/10 Yds.—10½ Tons
MODEL 125 A 6/10 Yds.—12½ Tons
Three New "QUICK-WAY" Carriers

The New "QUICK-WAY" has—

- Anti-Friction Bearings—On all high speed shafts and drums.
- Bull Gear and Hook Rollers—Perfectly balanced design.
- All Chain and Sprocket Drive—Dependable, positive power.
- Power Up and Down Boom—Standard on both models.
- Hydraulic Control System—Smooth, positive, minimum-effort control.
- Comfortable, Full Vision Cab—All controls conveniently located.
- Central Lubrication System—Available on both models at extra cost.

You have to see it—feel the way it handles—to fully realize that the all new "QUICK-WAY" is revolutionary in the small shovel field. Call your distributor today for a FREE demonstration.

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CITY _____ STATE _____

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Camp's Concrete Topping and Latex Industrial Flooring were employed at the Illinois Institute of Technology in Chicago to smooth and level a fire-damaged concrete floor.

Case history

Concrete topping saves fire-damaged slab

When a fire caused by the explosion of an oil salamander badly blistered, pitted, and gouged nearly 20,000 square feet of a newly-poured 8-inch concrete basement floor in the Architecture, Design, & Planning Building of the Illinois Institute of Technology in Chicago, the Dahl-Stedman Co., Chicago, was faced with the problem of restoring the damaged concrete slab and still finishing the construction of the building in time for the new school term.

The burning oil from the salamander had destroyed the plywood forms supporting the first floor deck, which had been poured earlier that day. Both the formwork and the new concrete fell into the basement, making holes as much as 1/2-inch deep in the basement slab.

Established heights made it impracticable to raise the floor the 2 or 3 inches that would be necessary if a concrete topping were to be poured. Any attempt to remove 2 inches from the top of the slab was considered hazardous because of the possibility of fracturing the slab.

The problem was solved by Latex Industrial Flooring and Latex Concrete Topping, waterproof resurfacing materials manufactured by The Camp Co., Inc., that are resistant to grease, many chemicals, and acids. Because the topping could be applied as thin as 1/4 inch, it did not interfere with established heights. The building was completed on time despite the accident.

For further information on these resurfacing materials write to The Camp Co., Inc., 6958 S. State St., Chicago 21, Ill., or use the Request Card at page 18. Circle No. 214.

Hose catalog

A complete line of hoses is detailed in a catalog from the Thermoid Co. Air, ammonia, hydraulic, oil and gasoline, steam, water-suction, welding, and five multipurpose hoses are described. Data is given on hose couplings and fittings. Also described are multiple V and flat transmission belts, chute lining, rubber sheet packing, and friction materials.

To obtain Form 3765-R write to the Thermoid Co., 400 Whitehead Road, Trenton 6, N. J., or use the Request Card at page 18. Circle No. 31.

Automatic asphalt plants

A bulletin issued by Hetherington & Berner, Inc., describes the automatic cycle control now furnished on H & B batch-type asphalt plants. This automatic control of the entire mixing cycle results in greater production—at lower cost per ton—and more uniform mix, according to the literature.

Operation of the new cycle control, an optional automatic weighing system, and the Fluidometer automatic liquid-metering system are explained, and elements of these automatic asphalt plants are pictured.

To obtain Bulletin No. AA-56 write to Hetherington & Berner, Inc., 701 Kentucky Ave., Indianapolis 7, Ind., or use the Request Card at page 18. Circle No. 270.



THIS CENTER-LINE MARKER, designed by the equipment division of the Kentucky Department of Highways, has paint spray guns mounted on a shop-made trailer suspended from the front end of the extended frame. The front-end attachment is raised and lowered by means of two steel cables wound on a winch which is driven by a hydraulic motor electrically controlled from the cab of the truck. The truck is a Chevrolet T-255; a Chicago Pneumatic compressor pumps the paint.

Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back at ground level gets BIGGER LOADS with less spillage.



Keeps More

Heaped loads are cradled closer to the machine for greater stability and can be carried at lower level. Exclusive load shock-absorber cushions the load during travel, smooths out the ride, and permits faster movement with less spillage.



Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds... with less spillage in both instances... the result—you deliver MORE. This new PAYLOADER is a more PRODUCTIVE machine which will handle more yardage at lower cost.



Case h

Load cuts

Build a square by more bearing was us \$91,750 Church system Anchor by Alu burgh. in half The fabricer which without

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The wheel-d the exc output jobs ne tractor-

It smooth thing n and du produc proof e perform Distrib

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Case history

Load-bearing curtain wall cuts costs, erection time

Building costs that average \$15.00 a square foot for the area were sliced by more than 20 per cent when a load-bearing curtain-wall building system was used in the construction of the \$91,750 Saints Simon and Jude Church in Pittsburgh, Pa. The new system, called W-A-E (Weather-Anchor-Expansion) was developed by Aluminum Structures, Inc., Pittsburgh. It also cut construction time in half.

The W-A-E system consists of pre-fabricated aluminum wall panels which are designed to carry roof loads without additional supporting mem-



bers. They include integral structural framing, windows, doors, and insulation to form the finished wall. Clear roof spans up to 60 feet are possible for one-story buildings, according to

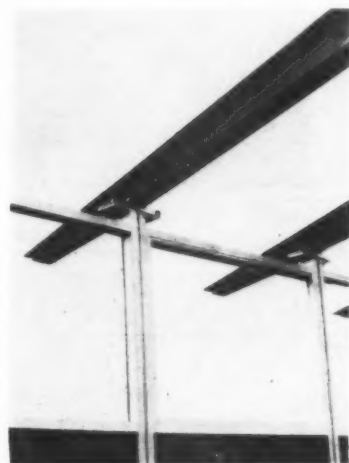
A five-man crew sets a three-panel module into place on anchor bolts. Structural framing, doors, windows, and insulation are all integral components of each panel.

the manufacturer, and the load-bearing interior partitions required for a two-story structure can serve to increase the width even further.

The new system enabled a five-man

team to raise the walls of the 120 x 40-foot church and to bolt on rafters in one day each. The steel deck was installed in two days for a total of four days to finish the shell.

The panels are 4 inches thick, insulated with 1½-inch-thick Fiberglas. They were factory-assembled in 12-foot-wide units from 4 x 8-foot modules, and weighed less than 6 pounds a square foot. The vertical aluminum edge pieces formed a built-in column



Steel rafters for the roof are bolted to the top of the module mullions.

when joined to carry the rafters.

The W-A-E panels were bolted directly to the slab flooring. Specially-made roof trusses were placed on and fastened to the panel mullion heads.

For more information on this load-bearing curtain wall construction system write to Aluminum Structures, Inc., 633 Washington Road, Pittsburgh 28, Pa., or use the Request Card at page 18. Circle No. 223.

Structural systems

■ Complete structural systems consisting of steel columns and beams, framing units, decking, and metal curtain-wall panels are described in a catalog from Stran-Steel Corp. The components of the systems are illustrated, and a series of job photos show their application. Design details, properties, and dimensions of the structural members are given in diagrams and tables.

To obtain the catalog write to Stran-Steel Corp., Division of National Steel Corp., Tecumseh Road at Pink, Ecorse, Detroit 29, Mich., or use the Request Card at page 18. Circle No. 128.

Wire rope uses

■ The various uses of wire rope in construction are illustrated and described in a catalog from the American Chain & Cable Co. Its use on dozers, scrapers, mixers, pavers, derricks, draglines, shovels, winch trucks, conveyors, cranes, and dredges is described. Other uses of wire rope are detailed. Each recommendation covers the rope diameter, construction, and performance.

To obtain Catalog DH-128D write to the American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 119.

more yardage at lower cost... New 2¼ yard **PAYLOADER**®

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. All the *exclusive* features that increase yardage output enable it to handle many kinds of jobs never before practical with wheeled tractor-shovels.

It operates easier and faster, rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want *proof* of its *productive capacity* and superior *performance*, ask your "PAYLOADER" Distributor for a demonstration.

Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base, the utmost in stability is achieved.

More Production, Less Effort

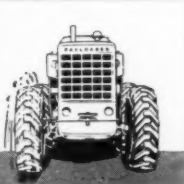
Power-steering, power-brakes on all four wheels, power-shift with no clutching or stopping for range changes and good balance and riding qualities reduce operational fatigue—promote full production all day.

Digging Power

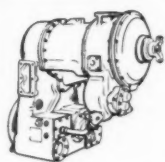
Pound for pound, the new model HO has more traction and digging power—for a wider range of ground conditions—than any wheeled tractor-shovel ever built.

Torque-Proportioning Differentials Reduce Wheel Slipping

Another exclusive "PAYLOADER" feature which assures better traction under adverse conditions. If one wheel starts to spin, more power is delivered automatically to the other wheel.



Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing keep torque low in axles, prolong life of drive-train parts as well as axles.



Complete Power-Shift Transmissions

"Complete" since ALL shifts can be made instantly and on-the-go, under full engine speed.

There's NO STOPPING for a range-shift, there's no foot clutch pedal. With the forward-reverse control, the operator can "inch" the machine while maintaining full engine speed to provide maximum bucket lifting and dumping power. Torque converter drive cushions power-train shocks.

THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER" tractor-shovels:

☐ model HO ☐ model HH ☐ model HU
2¼ cu. yd. heaped, 1¾ cu. yd. heaped, 1 cu. yd. heaped,
1¾ cu. yd. struck 1½ cu. yd. struck ¾ cu. yd. struck

Name _____
Title _____
Company _____
Street _____
City _____ State _____

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 383

A NEW, MORE COMPACT CRAWLER MODEL of the multipurpose Gradall has been announced by The Warner & Swasey Co. The crawler mount has been redesigned for more power, with two speeds available at full power both forward and back-



ward. Simplified controls actuated with one lever regulate the speeds of the crawler, which has a 44-hp engine. A selection of tracks ranging from 18 through 48 inches make it possible to mount this Gradall model on tracks with as low as 3½ psi in bearing pressure, according to the manufacturer. The low speed with full power is said to make the new Gradall easier to operate on steeper grades than earlier models. For further information write to the **Gradall Division, The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio**, or use the Request Card at page 18. Circle No. 66.

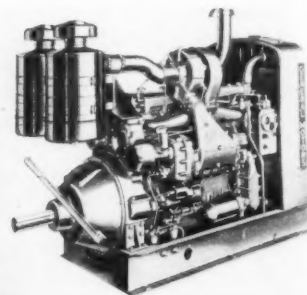
New turbopower diesels offer fuel economy

■ The Detroit Diesel Engine Division of General Motors has announced three turbopower engines as additions to its Series 71 line of industrial two-cycle diesels. The new units include four and six-cylinder fan-to-flywheel engines and a six-cylinder base-mounted power-takeoff unit.

With the addition of a single-shaft exhaust-driven turbine and air impeller to the standard Series 71 engines, a more powerful diesel of even greater fuel economy has been produced, the company reports.

The four-cylinder engine has a rating of 171 basic horsepower at 2,300 rpm. The "Six" is rated at 236 basic horsepower at 2,100 rpm. Because of

their compact size in relation to horsepower and their better fuel economy, these flexible engines are said to be ideally suited for use as replacement power in on and off-the-



Detroit Diesel's Series 71 six-cylinder turbopowered package power unit is rated at 236 basic horsepower.

highway trucks. Both fan-to-flywheel engines weigh approximately 9½ pounds per horsepower.

According to the company, the new units attain increased horsepower and better all-around efficiency at all engine loads through improved combustion with no increase in fuel input. An exhaust-driven turbine and air impeller team up with the engine-driven blower to increase the scavenging air supply and the pressure at which it is delivered to the cylinders. This results in higher air-to-fuel ratios, which, in turn, contribute to increased horsepower and better fuel economy.

A fast and complete discharge of exhaust gases in turbopower engines has been attained by increasing the number of exhaust valves in each cylinder from two to four. The valves are activated by rocker arms on the head as in other Series 71 engines, but each rocker arm activates two valves. This is accomplished by a bridge piloted on a vertical shaft screwed into the cylinder head.

For further information write to the Detroit Diesel Engine Division, General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., or use the card at page 18. Circle No. 167.

Diesel-electric sets

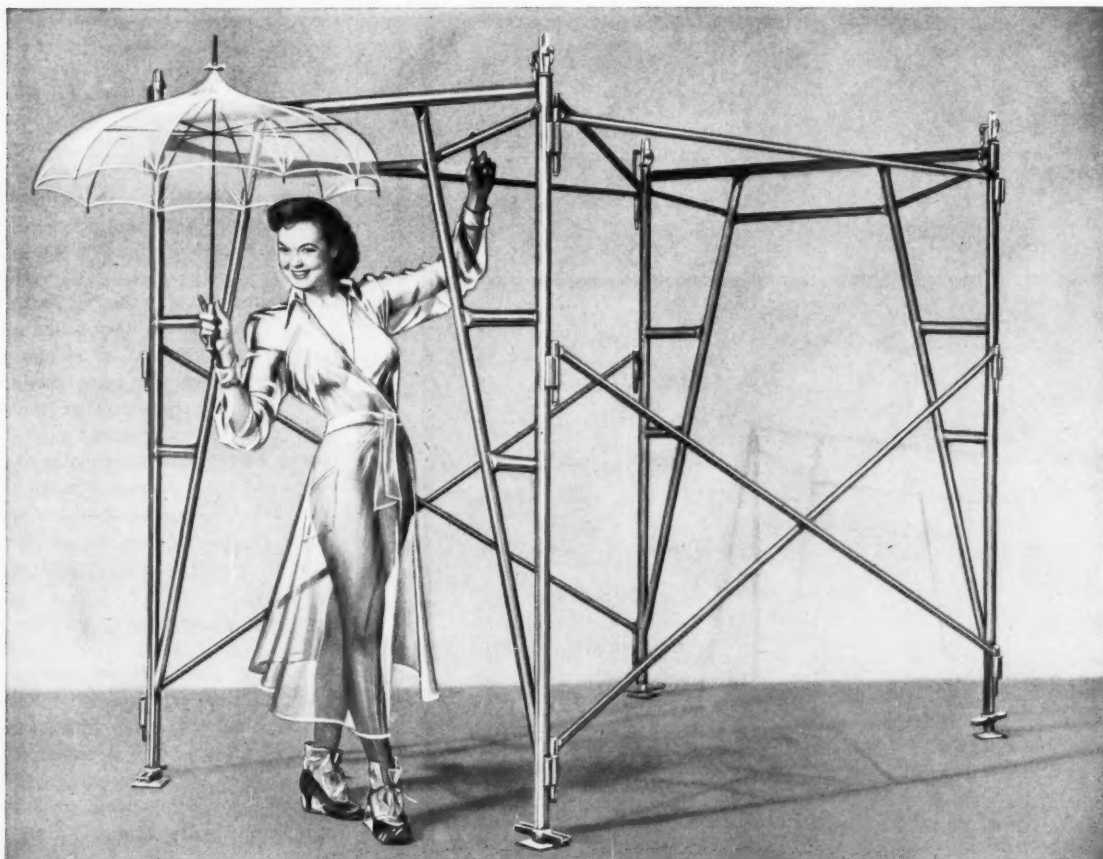
■ Four models in Universal Motor's line of diesel-electric generating sets are featured in a bulletin from the company. There is one four-cylinder model, and the other three are six-cylinder units, all having varying piston displacements. Standard equipment, electric and remote controls, and specifications are described.

To obtain Form No. HSE-1 write to the Universal Motor Co., 428 Universal Drive, Oshkosh, Wis., or use the Request Card at page 18. Circle No. 41.

Shovel cranes

■ A mailing piece briefly describes various models of Bantam shovel-crane. Action shots point out the many uses of the company's crane, backhoe, dragline, and shovel. Also shown are three crane carrier models.

To obtain Bulletin 256 write to Schield Bantam Co., Waverly, Iowa, or use the Request Card at page 18. Circle No. 27.



You have a 'skin protection' problem in your scaffolding, too!

A raincoat or umbrella won't protect your scaffolding—but now there is a foolproof answer for you to keep scaffold surfaces lastingly smooth. Insist on the only available "skin protected" scaffolding—Universal Galvanized.

Through this new galvanized coating, Universal has made it possible for you to forget all about profits and time lost by your men if they must work with corroded, rusted scaffolding. Now every part of this top-quality scaffolding is covered with a smooth, lubricative coating which permits maximum "workability" in minimum erection time with no costly maintenance—and at not one cent of extra cost.

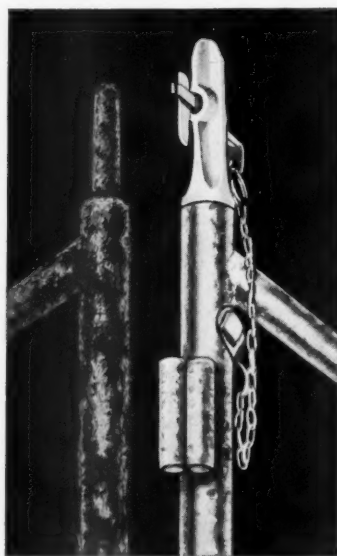
This exclusive feature, plus the ease of assembly afforded by Universal's exclusive Gravity-Lock mechanism, is your assurance that when you buy or rent Universal Galvanized, you are using the *ultimate* in steel scaffolding available today.

Write for our catalog describing the available sizes and types of panels for all types of construction, mason, or maintenance applications.

"American Tubular" Elevators now galvanized also—Write for catalog.

UNIVERSAL *the only* **GALVANIZED SCAFFOLD**

UNIVERSAL MANUFACTURING CORP. • ZELIENOPLE 1, PA.
For more facts, use Reader-Reply Card opposite page 18 and circle No. 384





Case history

Valve job renews engine after 122,000 miles

A firm of construction engineers, the Ransome Co., Emeryville, Calif., decided to pick out the highest-mile-aged truck in its fleet of 17 Model 22-R and F-506 Reos and see how the engine was holding up. Picked for the inspection was a 22-R with 122,000 miles of operation.

Removing the head, Ransome mechanics discovered that a grinding of the valves was all that was required in the way of repairs. Another six months have passed since the valves were ground and no other engine repairs have been necessary.

"This certainly speaks well for the efficiency and economy of the Reo truck and its Gold Comet OH-140 and OH-160 engines," Lynn A. Schloss, vice president of the Ransome Co., comments.

For more information on Reo trucks write to Reo Motors, Inc., 1331 Reo Square, Lansing 20, Mich., or use the Request Card at page 18. Circle No. 203.

Scraper line

■ Specifications sheets detail each piece of equipment described in a catalog on the Wooldridge line of scrapers. Models shown include the Cobra, for rear mounting on two-wheel tractors; the Cobra Quad, for rear mounting on four-wheel tractors; and the Cobrahaul rear-dump hauler. Other scrapers pictured have capacities of from 8 to 45 cubic yards. Data is also given on rippers and cable controls.

To obtain the literature write to Wooldridge Mfg. Division, Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., or use the Request Card at page 18. Circle No. 170.

International Harvester changes division name

The Industrial Power Division of the International Harvester Co., Chicago, Ill., has had its name changed to the Construction Equipment Division. Neither the personnel of the division nor the equipment manufactured by it, are affected by the change. The renaming was made solely because company officials felt that Industrial Power Division did not accurately describe the products of the division.

After being on the job for 122,000 miles, a Model 22 Reo truck brought into the Ransome Co. shop for an engine inspection needed only a valve-grinding job.



"Yep, pretty sharp, this automation. . ."



Mr. Clipper

Call or write your Factory Trained Clipper Representative for a FREE DEMONSTRATION of a Clipper Concrete Saw. See for yourself how Clipper's Simple design, Rugged construction and Dependable performance will mean faster cutting on all concrete and asphalt jobs.

Mail the Coupon

FOR FACTS ABOUT

CLIPPER

CONCRETE SAWS

and **BLADES**

CLIPPER MANUFACTURING CO.
2803 SE Warwick Kansas City 8, Mo.

☐ Send information on CLIPPER GREEN-CON ABRASIVE Blades
☐ FOR Green Concrete Sawing. I'd also like to know about:
☐ DIAMOND Blades for Concrete Sawing.
☐ Masonry Abrasive and Diamond Blades
☐ Concrete Saws ☐ Masonry Saws
☐ Please have my FACTORY TRAINED REPRESENTATIVE call on me.

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ADDRESS _____ STATE _____
CITY _____

BUY CLIPPER QUALITY AND SAVE



Clipper
"SAILS RIGHT THRU"
SAWS & BLADES

Look for the Bright ORANGE Center and the Trade Mark CLIPPER

DIAMOND GREEN-CON DIAMOND

Power For Every Job
7½-25-up to 36 H. P.

Ask for
FREE TRIAL
DEMONSTRATION
on
Your Job



Model E-250
25 H. P.
A Model To Fit Every Budget
from \$395

• Clipper offers the only complete range of specifications in DIAMOND and GREEN-CON ABRASIVE BLADES for cutting asphalt and green or cured concrete with ANY aggregate . . . and ONLY from Clipper can you get FACTORY TRAINED REPRESENTATIVES to help you. For FIRST QUALITY Products and FIRST QUALITY Service call Clipper . . .

USE GENUINE CLIPPER BLADES

Let your Factory Trained Representative help you select the right Clipper Blade for your job.

• **GREEN-CON ABRASIVE BLADES** give you savings as high as 80% with Clipper's New Reinforced GreenCon Abrasive Blades. A range of specifications for all types of limestone aggregates, as well as harder aggregates when mixed with limestone. GreenCons are available to cut 3/16"-1/4" and 3/8" wide joints.

• **DIAMOND BLADES** for any job — any aggregate — every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy. **IF YOU DON'T KNOW DIAMONDS, KNOW YOUR MANUFACTURER.**

Clipper
"SAILS RIGHT THRU"

SOLD DIRECT by Factory Trained Representatives—
Factory Branches in Principal Cities—Coast to Coast.
GENERAL OFFICES AND FACTORY • KANSAS CITY 8, MISSOURI

For more facts, use Reader-Reply Card opposite page 18 and circle No. 385

manufacturer memos

Marion Power Shovel elects new president

Directors of the Marion Power Shovel Co., Marion, Ohio, and of its subsidiary, the Osgood Co., have elected Milton T. Smith president of



Milton T. Smith, president and general manager of the Marion Power Shovel Co.

the firm. Formerly vice president and general manager of both companies, Smith had been serving as their chief executive officer.

Both firms are part of the equipment department of Merritt-Chapman & Scott Corp., New York, N. Y.

At the same time, the company appointed Thomas F. Purcell divisional sales manager in the eastern sales area. He will be responsible for the sale of Marion equipment in the New England states.

William Kelly Graves will serve as district sales manager for the states of Texas, Oklahoma, and New Mexico. He will make his headquarters in Dallas, Texas.

Aeroil elects president

Aeroil Products Co., Inc., South Hackensack, N. J., manufacturer of construction, road-maintenance, and industrial equipment, has elected Charles V. Schaefer, Jr., president, general manager, and director of the firm. He succeeds Earl E. Anderson in the post.

John A. Collins and Stanley H. Montfort were also elected to the board of directors.

Timken appoints managers

The Timken Roller Bearing Co., Canton, Ohio, has appointed Sherman R. Lyle district manager of the firm's steel and tube division office in Cleveland, Ohio. Formerly manager of the Buffalo, N. Y., office, Lyle replaces R. P. Donnell in the post.

R. P. Donnell will serve as district manager of the firm's steel and tube division offices in New York, N. Y. With the company since 1939, Donnell was formerly manager of the Cleveland office.

Greer Hydraulics appoints

Ernest W. Marchand has been appointed director of manufacturing for Greer Hydraulics, Inc., Jamaica, N. Y. New to the Greer organization, Marchand has had over 30 years' experience in manufacturing.

F. Parker Westerberg has joined the firm as a sales engineer. He will serve the New England territory, including the state of Connecticut.

Goodyear executive change

A series of changes in the executive structure of the Goodyear Tire & Rubber Co., Akron, Ohio, have been effected. P. W. Litchfield, chairman of the board, has turned over authority and responsibilities as chief executive officer to E. J. Thomas, president of the organization.

Thomas then appointed R. S. Wilson, P. E. H. Leroy, and R. DeYoung to executive vice presidencies in charge of sales, finance and accounting, and personnel, research, and development, respectively.

Also appointed to vice presidencies were Victor Holt, Jr., L. E. Spencer, and F. J. Carter. C. C. Gibson, manager of original equipment and government sales, and P. K. Coe, man-

ager of the company's Detroit, Mich., office have been promoted to vice presidencies of a subsidiary sales company, The Goodyear Tire & Rubber Co., Inc.

Two vice presidents, J. M. Linforth and F. W. Climer, have retired.

Leland E. Spencer, former assistant to the president, has been named a vice president of the company. He will direct purchasing, general merchandising and material control, the rubber plantations, and rubber purchasing.

Heading the newly formed San Francisco, Calif., district office of the industrial products division is H. L. Narwitz. In addition to his new duties, Narwitz will also retain his position as manager of the division's Portland, Oreg., district office.

Worthington appoints

Two new commercial vice presidents, A. William Fraser and Clarence S. Wentworth, have been appointed by the Worthington Corp., Harrison, N. J.

Mr. Fraser, the firm's midwest regional sales manager since 1951, will be in charge of the district sales offices in Chicago, Denver, Kansas City, St. Louis, and Minneapolis. He will make his headquarters in Chicago.

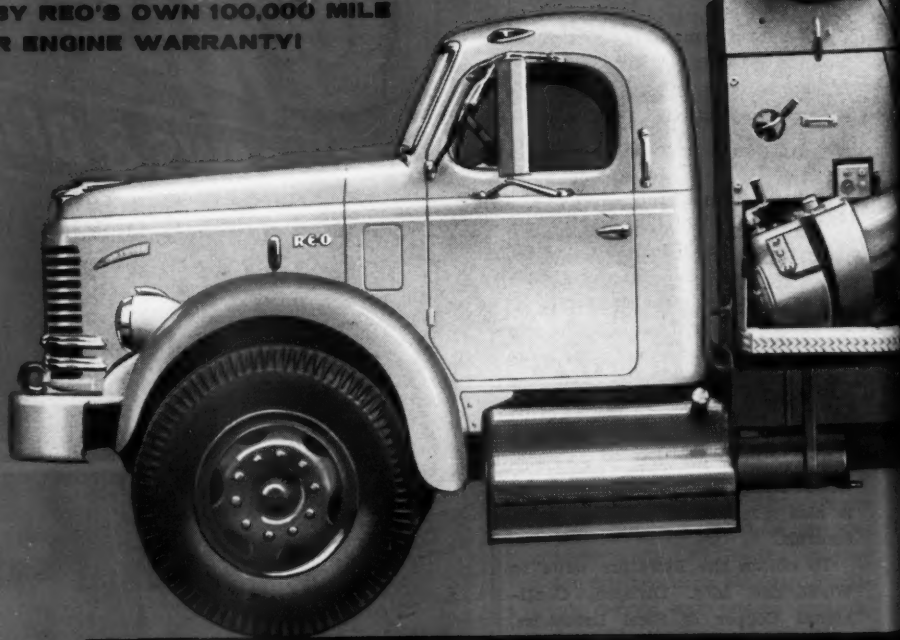
Responsible for district sales offices at Buffalo, Cincinnati, Cleveland, Detroit, and Pittsburgh, Wentworth is sales manager of the central region. His headquarters is in Cleveland, Ohio.

John J. Thompson has been appointed manager of the newly created

HAUL 6½ YDS. WITHIN 32

Low-weight chassis design of New Reo F-506M guarantees it!

POWERED BY REO'S OWN OH 160
GOLD COMET ENGINE—GAS OR LPQ...
BACKED BY REO'S OWN 100,000 MILE
OR 1-YEAR ENGINE WARRANTY!



14,000 LBS.

The certified chassis weight of Reo's new F-506M is 11,240 lbs. The official weighmaster's receipt proves how it can haul 6½ yds. of concrete and stay well within legal limits. The new Reo F-506M is designed and built specifically for mixer use. Its increased payload is made possible by Reo's new high-strength, low-weight double-side-rail frame construction.

The new Reo F-506M actually hauls up to 2 yards more than the average mixer chassis. And it places as much as 6,000 pounds more on the front axle than other conventional mixer trucks.

Reo full power steering, which is standard, makes maneuvering easy in tight places anywhere.

The new F-506M is powered by Reo's own 160 hp short-stroke, wet-sleeve Gold Comet Engine. Plenty of power for both truck and mixer. And, it's backed by

Reo's famous 100,000 mile or one year warranty.

Reo's exclusive front-axle-payload design places more weight forward—giving you an extra 2 cubic yards of concrete every trip. With it, you can haul your regular daily volume with fewer trucks and drivers . . . or increase volume without increasing your fleet.

For states that permit greater axle loadings than 32,000 lbs., Reo builds the F-536M—52,000 lbs. G.V.W.

Additional hundreds of pounds can be added to the carrying capacity of the new Reo F-506M with Reo's optional front-end power take-off. The PTO also eliminates extra fuel and maintenance costs of the mixer's auxiliary power unit.

Call your Reo branch or distributor today and get the facts on the Reo that's right for you. Mail the coupon for full information.

salaried personnel department and will assume all functions of the corporation's present personnel and training department. He will be assisted by Robert C. Hughes, the new director of training.

Charles D. Cummins has been named manager of the Seattle, Wash., district office. A member of the Worthington organization since 1925, Cummins has been assistant manager in Seattle since 1949.

Standard Oil manager

The new manager of asphalt and heavy-fuel sales for Standard Oil Co., of Indiana is A. T. Hague. He will make his headquarters at the firm's general offices in Chicago, Ill.

With Standard Oil since 1926,

Hague is a member of the Association of Asphalt Paving Technologists, The American Society of Testing Materials, and the American Petroleum Institute. He also serves as a director of Murphy-Miles Oil Co., a Chicago subsidiary of Standard Oil.

New Flintkote executives

Two new executives have been elected by the Flintkote Co., New York, N. Y. Dennis J. McNamara will serve as vice president and controller and William Feick, Jr., as treasurer of the firm.

McNamara has been assistant treasurer of the company since 1939.

H. H. Whittemore will serve as general sales manager of the building materials division. He had formerly

been manager of the western division sales.

Austin Co. names manager

B. Raymond Sayer has been appointed manager of plant location surveys for The Austin Co., engineers and builders of Cleveland, Ohio. With the firm since 1935, Sayer has done location work throughout the United States and Canada for industry and for the Atomic Energy Commission.

F. D. Cummer appoints two new executives

The board of directors of the F. D. Cummer & Son Co., Cleveland, Ohio, has elected Robert N. Birdsall to the post of vice president and general

Robert N. Birdsall, vice president and general manager of F. D. Cummer & Son Co.



manager of the firm. He had been the firm's general manager and chief engineer since 1952, responsible for sales and engineering in the field and for plant layout.

Fred E. Roedger was named comptroller and assistant treasurer.

Sonneborn Sons names new marketing manager

The new marketing manager for the Building Products Division of L. Sonneborn Sons, Inc., New York, N. Y., is Aaron Kaplan. Formerly manager of industrial research for the division, he will now be responsible for sales and marketing activities and sales training.

Extruded plastic used to insulate motors

The Lincoln Electric Co. has announced its re-entry into the electric-motor field after 15 years, introducing a new line of Linc-Weld motors which it says represents a major advance in design because of an extruded plastic insulation.

The motors, available in standard sizes from 1 to 40 horsepower, are reported to be the first in this range



of sizes with such insulation. The line is built in the open-type frame and torque design B, and complies with NEMA specifications.

The plastic has demonstrated exceptional resistance to chemical action, humidity, abrasive dust, and oil vapor. In addition, the insulation provides thermal protection and minimizes hot spots on the wiring.

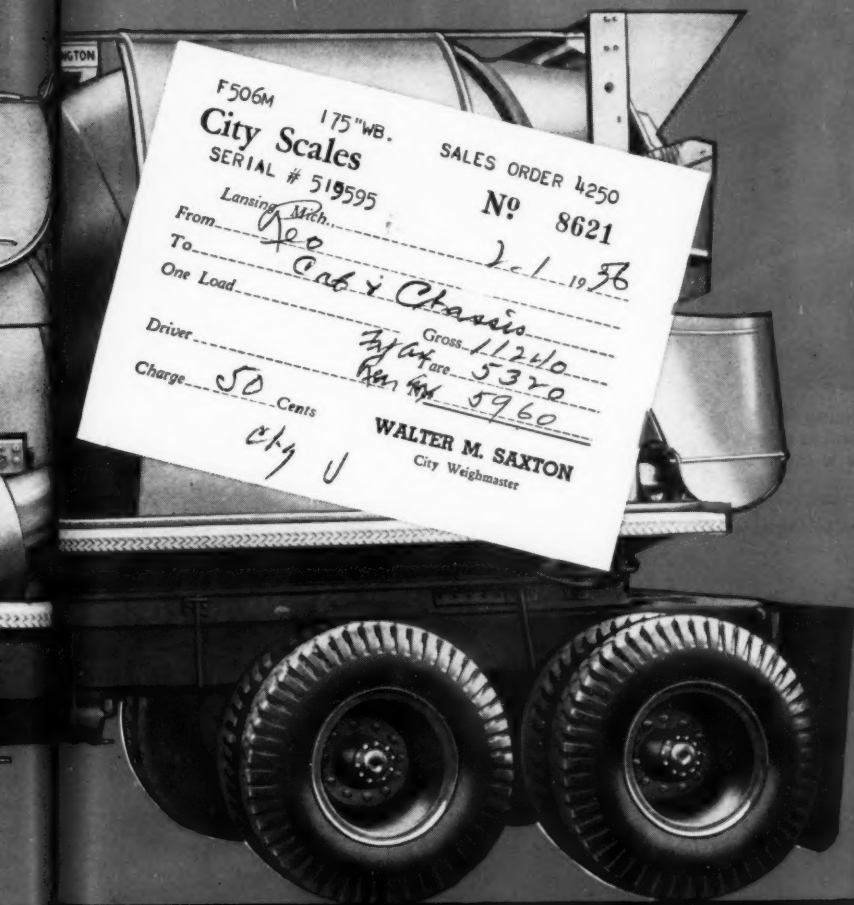
For further information write to the Lincoln Electric Co., P. O. Box 5758, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 69.

Steel bar cutter

The Curry Air Shear Corp.'s Model-A shear for cutting small cross sections of ferrous and non-ferrous metals is described in a bulletin. According to the specifications chart, the 1,500-pound unit, which may be used for cutting reinforcing steel, will handle 1-inch diameter mild steel rounds at 80-psi air pressure. The adjustment and maintenance of the unit is detailed.

To obtain Bulletin No. 50 write to Curry Air Shear Corp., 942 Oliver Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 171.

N 32,000 lb. TANDEM LIMIT



32,000 LBS.

REO

REO MOTORS, INC.
LANSING 20, MICHIGAN

SUBSIDIARY OF **BOHN** ALUMINUM AND BRASS CORPORATION

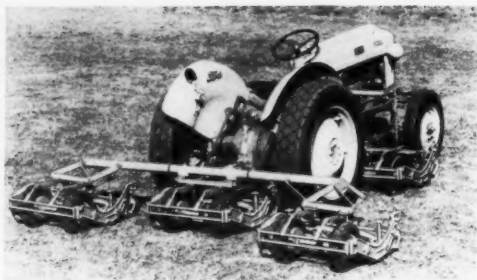
Please send at once:

☐ Complete Specifications on F-506M. ☐ Reo Front-End Power Take-off. ☐ New Tandem Catalog.

NAME _____
COMPANY _____
TITLE _____
ADDRESS _____
CITY _____ COUNTY _____ STATE _____



For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 386



Drive wheels behind instead of at the ends of the reels permit the Highway Challenger five-gang mower to cut close to signs, guardrails, and other obstacles.

Rear-drive mower cuts flush with obstacles

■ The Roseman Mower Corp. has announced a heavy-duty, lift-type, five-gang mower designed for efficient and safe mowing of turf areas bordering highways. The Highway Challenger is a tractor-mounted mower that is raised hydraulically for traveling.

Malleable side frames, reels of chrome nickel alloy steel, Timken bearings, a shock-absorbing reel-bed knife design, and laminated, "no-air" tires are features of the rig. A wide range of cutting-height adjustment permits the reels to mow down to park-like conditions or to mow in a raised position to prevent damage from hidden obstructions.

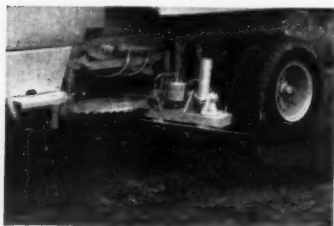
The rear-drive design places the drive wheels behind instead of at the ends of the reels. Consequently, the outer reels can mow flush with flower beds, close to trees, guardrails, signs, abutments, markers, and other obstacles. For mowing in congested areas, the removal of two pins is all that is required to eliminate two reels and change the rig to a three-gang mower.

For further information write to the Roseman Mower Corp., 2618 Ridge Road, Evanston, Ill., or use the Request Card that is bound in at page 18. Circle No. 80.

Planing attachment grades, removes ice

■ A versatile year-round maintenance unit offered by the Wausau Iron Works is designed to maintain roads, airports and other areas. Speeds range from 6 to 20 mph.

The Wausau truck patrol ice planer cuts and grades all types of gravel



and dirt roads, and is said to eliminate ruts, holes, and washboards. For winter operation, the unit planes, breaks, and removes ice and hard-packed snow. Full-power hydraulic control from the cab permits the operator to reverse, tilt, and rotate the working blade to the best operating position for all conditions.

Mounted under a truck, the planer can be ballasted with extra weight for heavy cutting of earth or ice.

For further information, write to the Wausau Iron Works, Wausau, Wis., or use the Request Card at page 18. Circle No. 67.

New folding steel legs make portable saw horses

■ Weldon Products has announced the development of a complete line of folding steel legs that produce a reciprocal gripping lever action on a standard 2x4 when the legs are spread at the bottom. The upper "gripper-claw" portion of the legs bites into standard 2x4-inch lumber as the legs open.



The "gripper claw" portions of Weldon folding steel legs bite into 2x4's as the legs are opened and securely support up to a ton, depending on the height of the legs.

The Weldon folding steel legs are fabricated from 1/8-inch angle iron with all moving parts riveted. They are reported capable of supporting from 500 to 2,000 pounds in pairs, depending on their height. They are available in pairs in six heights between 14 and 48 inches.

The manufacturer recommends the legs for use in assembling carpenters' saw horses, painters' scaffolding, work benches, drafting tables, and the like. The legs are equipped with alignment flanges which maintain accurate positioning of wood in horizontal and vertical relationship to the supports.

For further information write to Weldon Products, 1451 E. Nine Mile Road, Hazel Park, Mich., or use the Request Card at page 18. Circle No. 84.

KOEHRING WORK CAPACITY in action . . .



Lightning struck twice, setting fire to two storage piles of resin-rich pinewood at this Southern powder plant. For 48 hours it raged out of control. Fire-fighting equipment wet paths as two Koehring 605 cranes moved in with orange-peel buckets—widened fire-breaks, salvaged wood.



Meet the new 405 — In eastern Canada, a city street gets its face "lifted" with a 1-yard, 405 hoe. It's a new size, recently added to the Koehring heavy-duty line — digs 43 inches wide over side-cutters, 22½ feet below grade. Check into its other work capacities at bottom of page.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
		(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-foot radius
205 ON RUBBER	½-Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-foot radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 13-foot radius

Want more information? Call Koehring distributor today.



10 years on the rock pile — Feeding rock to crusher at a Mid-West quarry, veteran ¾-yard Koehring shovel helps produce 1,000 to 1,500 tons of crushed rock per day. Shovel has been in use for over 10 years. In all this time, owner reports that his repair costs have been practically nil.

K629

EXCAVATORS



CRANES

DUMPTORS®

PAVERS

FINISHERS

CONSTRUCTION MIXERS

MUD-JA

CONTRACTORS AND ENGINEERS

Case history

Drills work 150 feet without resharpening

Sandvik Coromant integral drill steels, long used in hard-rock mining, drilled through more 150 feet of Manhattan schist without having to be resharpened during the construction of the New York City approach to the third tube of the New York-New Jersey Lincoln Tunnel. The steels are supplied by Atlas Copco Eastern, Inc.

Drillers report that they are able to cut thinner and more regular holes with the Sandvik rods than with other types, and the steels are lasting through from 1,500 to 2,000 feet of drilling. Gull Contracting Co., Inc.,



Sandvik Coromant integral drill steels drilled through more than 150 feet of Manhattan schist without resharpening on the construction of the Manhattan approach to the third tube of the New York-New Jersey Lincoln Tunnel.

Flushing, N. Y., is the contractor for the drilling on the east approach to the tube.

The foreman of one of Gull's crews reported, "These Sandvik Coromant steels are so rugged we can start off—even with a dull one—and do about four times as much drilling in the same amount of time as another crew can do with old-style rods and detachable bits."

The Gull crews are using 7/8-inch hexagonal integral steels with tungsten-carbide cutting edges. "We use these steels so long you'd think the inserts would fall out," the foreman added. "There's practically nothing left to hold them in by the time we discard them."

For more information on these drill steels write to Atlas Copco Eastern, Inc., 151 Linwood Ave., Paterson, N. J., or use the Request Card at page 18. Circle No. 201.

AGC predicts increase in construction activity

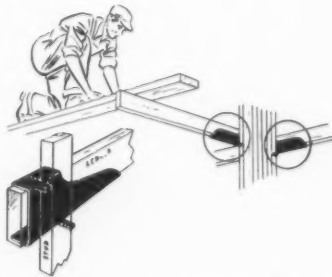
The Associated General Contractors of America, Inc., has indicated that the construction industry is about to show a marked increase in volume. Even though the first four months of this year barely equaled the \$11.8 billion of construction put in place in the same period in 1955, the association predicts that work will soar to \$44.5 billion in the coming months.

If the current level of nonresidential building continues, 1956 will probably be the first \$60 billion construction year in history. In addition to new construction, another \$15 billion in maintenance and repair is also expected.

Frank J. Rooney president of the AGC, also stated that the industry can be expected to produce \$75 billion in construction annually within the next decade.

Introduce improved version of stud jack

■ An improved version of the Double-Grip stud scaffold jack is now being offered by the Superior Scaffold Co.



According to the manufacturer, it can be quickly hung, without nails, on any exposed stud to provide instant scaffolding at a fraction of the usual cost.

The stud jack also complies with state safety codes which require hanging scaffolds to be anchored around or through the stud.

For further information write to the Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif., or use the Request Card at page 18. Circle No. 95.

185,000-ton rock slide — Extensive rock surgery will help curb further stream erosion at Niagara Falls. Work was made necessary when a weakened section of rock broke away from Lookout Point, at eastern end of the American Falls. Here, a Koehring 605 clamshell crane clears away debris and blasted rock.



KOEHRING COMPANY Milwaukee 16, Wis.

Subsidiaries: JOHNSON
PARSONS • KWIK-MIX

For more facts, use Reader-Reply Card opposite page 18 and circle No. 387

distributor doings

Clark distributor news

Two new distributors have been appointed to handle the Michigan line of tractor shovels and excavator cranes manufactured by the construction machinery division of the Clark Equipment Co., Benton Harbor, Mich. Both firms are located in Louisiana.

The E. C. Ray Machinery Co., Highway 80, Shreveport, will sell and service the equipment in Caddo, Bossier, Webster, Claiborne, DeSoto, Red River, and Bienville parishes. Twenty-eight other parishes will be

supplied with parts for these units by General Equipment, Inc., 435 Richmond Ave. at Government St., Baton Rouge.

Clark has extended the sales territory of Merts Equipment Co., Albany Ga., to include nine more Georgia counties and the Savannah Port Authority.

Canadian distributorship established by Euclid

Sales and service for the complete line of equipment made by the Euclid Division of General Motors Corp., Cleveland, Ohio, is being handled in the Province of Manitoba, Canada, by J. H. Ryder Machinery Co., Ltd.

The firm, with headquarters at 201 Main Street S. in Winnipeg, will han-

dle scrapers, rear and bottom-dump hauling units, and crawler tractors made by Euclid. J. H. Ryder heads the firm, which has William G. Webb as general manager.

New Koehring distributors

The Koehring Co., Milwaukee, Wis., manufacturer of heavy-duty construction machinery, and its subsidiary, the Parsons Co. of Newton, Iowa, have named new distributors.

The Edward G. Flaherty Co., 43-87 Vernon Blvd., Long Island City, N. Y., will handle complete sales, service, and rental activities for Koehring in New York counties south of and including Sullivan, Ulster, and Dutchess.

The Parsons Trenchliner will be

distributed by George Malvese & Co., New Hyde Park, N. Y. The firm's territory will cover lower New York State.

U. S. Industries acquires General Farm Equipment

The assets of General Farm Equipment Co., San Juan, Puerto Rico, have been acquired by U. S. Industries, Inc., New York, N. Y. A sales and service agency for many American and European manufacturers, General Farm Equipment handles Harnischfeger, Euclid, Clark, Warner & Swasey, Huber, and Ferguson equipment along with many other lines.

Cummins dealer in Idaho is under new ownership

Raymond L. Schwartz of Twin Falls, Idaho, has purchased the assets of Cummins Diesel Sales Corp., Boise, and will operate the firm as Cummins Idaho, Inc. Now located at 1204 Front St., Boise, the firm plans the construction of a new sales and service headquarters in the near future.

The firm will sell and service diesel engines manufactured by the Cummins engine Co., Inc., Columbus, Ind.

New B-E distributors

The Bucyrus-Erie Co., South Milwaukee, Wis., has named the Schultz Machinery Co., of Bismarck, N. Dak., a distributor of its full line of excavators and cranes. Serving the entire state, Schultz maintains a branch office in Minot, N. Dak., in addition to its main facility.

Baton Rouge Equipment Co., Inc., Baton Rouge, La., will cover southern Louisiana. The firm will maintain complete servicing facilities and a parts stock at its headquarters at 425 N. Beck Street.

Appointed as Hydrocrane distributor in eastern Kansas and western Missouri is the Burnup Equipment Co., Independence, Mo.

The new distributor, attached to B-E's midwestern sales district, will handle only the truck-mounted all-hydraulic Hydrocranes. It has its headquarters at 11303 Truman Road.

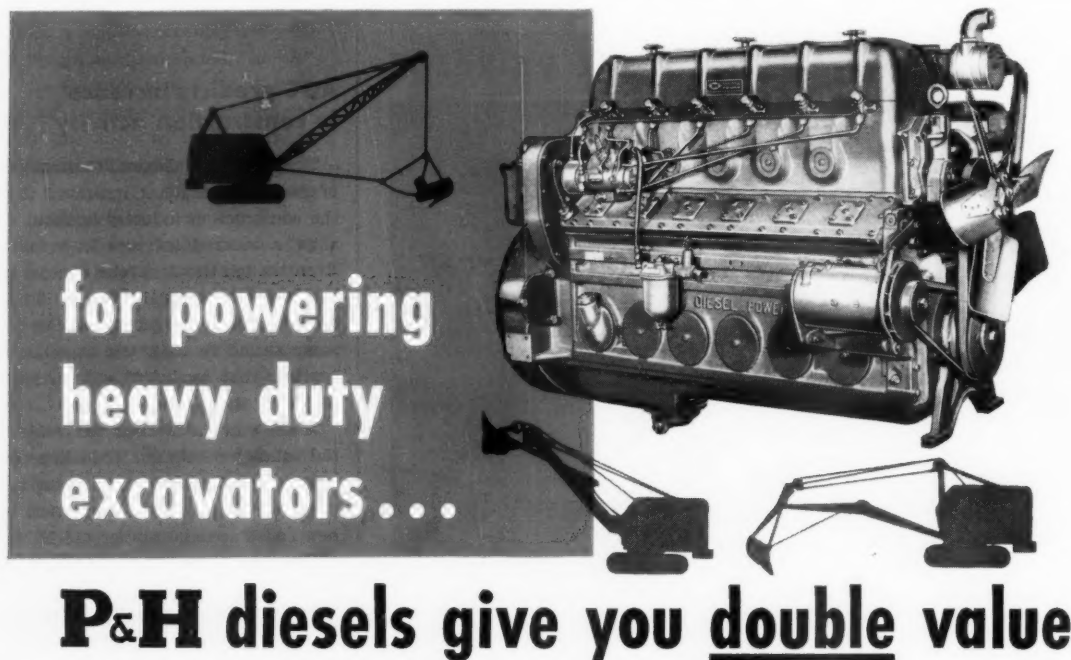
Smith Engineering names two new distributors

An exclusive franchise covering the eastern section of the state of Michigan has been granted to the Manegold Equipment Co., Detroit, by the Smith Engineering Works of Milwaukee, Wis. Manegold will handle the complete Telsmith line of equipment for the aggregate industry.

The Emmett C. Watson Co., Inc., Louisville, will be Smith's exclusive dealer in Kentucky and southern Indiana, with headquarters at 310 E. Brandeis Street.

Link-Belt names dealer

Representing the Link-Belt Speeder Co. of Cedar Rapids, Iowa, in the state of Oklahoma is the Herd Equipment Co., Oklahoma City.



**for powering
heavy duty
excavators...**

P&H diesels give you double value

1. Money Making Power...

For steady production at a high profit you can't beat the P&H Diesel 687-C18 for powering heavy duty excavators. It has the power, response and stamina to give you smooth, fast work cycles with every excavator attachment. You do more work, faster, at a lower cost.

A rugged, fast accelerating engine with a high torque, this 6-Cylinder P&H Diesel furnishes power to successfully handle the variable loads and momentary overloads encountered especially in shovel, dragline and trench-hoe services.

Costly down-time for restarts is held to a bare minimum. When heavy digging is encountered, the 2-Cycle P&H Diesel 687-C18 has the reserve power and punch to "pull through" without stuttering or stalling.

2. Money Saving Power...

Also, with a P&H Diesel you burn fewer gallons of low-cost fuel, you operate with less down-time for servicing and repairs, you experience longer periods between overhauls.

These money saving features of P&H Diesel power result from the extra reserve of power which is built into the P&H Engine 687-C18 for heavy duty excavator service. Reserve power minimizes engine stress and strain created by momentary overloads—adds to engine life—lowers maintenance costs—contributes to fuel economy.

P&H Diesel money making and money saving power add up to more power at lower operating cost for greater production and more profit for you.

**It will pay you to investigate
P&H Diesel's unique double values for the
powering of your heavy duty excavators
from 1½ to 2 yards in size.**

For Modern Engineering Look to
HARNISCHFEGER

P&H DIESEL ENGINE DIVISION
Crystal Lake, Illinois

P&H Diesel Engine Division
Harnischfeger Corporation
Crystal Lake, Illinois

Please send me complete information on P&H Diesel Engine 687-C18 for powering heavy duty excavators.

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 388

New Baker-Raulang dealer

Mechanical Handling Co., 1401 W. Garfield St., Seattle, Wash., has been appointed a distributor of trucks, cranes, and loaders manufactured by the Baker-Raulang Co., Cleveland, Ohio. The firm will cover western Washington.

Jetco names four dealers

Jetco Sales & Engineering Co., a division of Jetco, Inc., Alhambra, Calif., has appointed four new dealers in California. The dealers, Pringle Tractor Co., Salinas; M. F. D., Inc., San Jose, San Leandro, and Healdsburg; Tractor Specialties Co., Cotati; and Dome Tractor Co., Sacramento, will handle Vermeer Pow-R-Ditchers.

New Gradall distributor

Southwood Machinery Sales, RR #6, Indianapolis, Ind., has been named a distributor of Gradall machinery by The Warner & Swasey Co., Cleveland, Ohio. The firm will cover a territory including the southern part of Indiana and all of Kentucky.

Handling the state of Iowa for Gradall are the Hanstrom-Hubley Tractor Co., 711 Third Ave. S. E., Cedar Rapids, and the Vivian Equipment Co. of Ames. Vivian will cover all but twelve counties in the southwestern part of the state.

Pioneer names dealer for South Dakota area

Sheehan-Bartling, Inc., Sioux Falls, S. Dak., has been appointed a distributor of equipment manufactured by Pioneer Engineering Works, Inc., Minneapolis, Minn., a subsidiary of Poor & Co., Chicago, Ill. From headquarters at 817 W. 12th St., the dealer will cover the entire state of South Dakota.

Pneumatic-tire roller

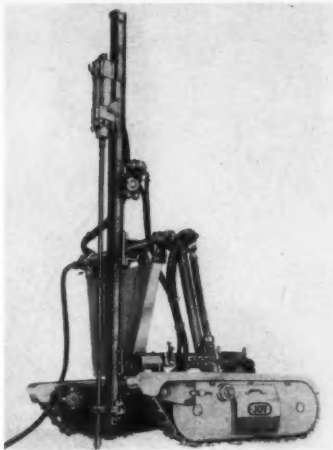
A self-propelled pneumatic-tire roller that has complete oscillation in all rear wheels is featured in a bulletin from Wm. Bros Boiler & Mfg. Co. The unit's 18-foot turning radius, controlled hydraulic steering, 50-hp gasoline engine, three-speed transmission, and water-sprinkler system are described.

To obtain the bulletin write to Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 15.

Portable drafting unit

A portable drafting unit designed to operate on an 11×17-inch board is described in a brochure from David Miller & Associates. Called Draftette, the unit does not require a skilled operator. The brochure states that all scales are calibrated to 0.0005 inch. Draftette is said to eliminate the need for T-square, ruler, protractor, and triangles.

To obtain the brochure write to David Miller & Associates, P. O. Box 572, Beverly Hills, Calif., or use the card at page 18. Circle No. 19.



The Joy Junior Challenger power-operated wagon drill.

Hydraulic wagon drill bores to 40-foot depth

What is reported to be the first completely power-operated wagon drill yet developed has been announced by the Joy Mfg. Co. Called the Junior Challenger, it is a self-propelled, track-mounted drill that mounts a heavy (360-pound) 4½-inch drifter and drills up to 3½-inch-diameter holes to depths of 40 feet in any formation.

All movements of feed and drill are performed hydraulically; consequently, no chuck wrench is necessary.

Tramming power is provided by two air motors which are direct-connected, thus eliminating drive chains. Each tread moves up or down independently to conform with the terrain, then is locked simply by turning a valve. This feature is said to provide absolute stability while drilling.

The Junior Challenger drills at any angle, and is recommended for vertical bench holes, toe holes, horizontal holes to 7½ feet in height, and angle holes both up and down from the horizontal.

For further information write to the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 159.

8-STORY ADDITION STARTS 70 FEET UP! American Carries the Load

An 8-story addition on top of the Federal Reserve Bank of Minneapolis kept an American 3-Drum Hoist in full operation from the first day on the job! Because the 6-story bank building was occupied, all materials for the job, except the steel, had to go up the hoist. As the job progressed, the double-well tower rose to a height of 225 feet! The American Hoist got a real workout on this job—long, heavy hauls clear to the top demanded plenty of steady power and easily controlled clutches. "Dropping" the elevator cars as much as 200 feet meant the brakes had to take hold firmly, smoothly without fail every time! Lives depended on the American Hoist—and profits too, because it was the only link between the ground and the job! Here's what went up on the American Hoist: 4,000 yards of concrete; 1,000,000 bricks and tile pieces; 6,000,000 pounds of plaster; 5,000,000 pounds of Indiana limestone; 1,000 windows, and 1,000 spandrels—plus equipment and materials for plumbing, heating and air conditioning!

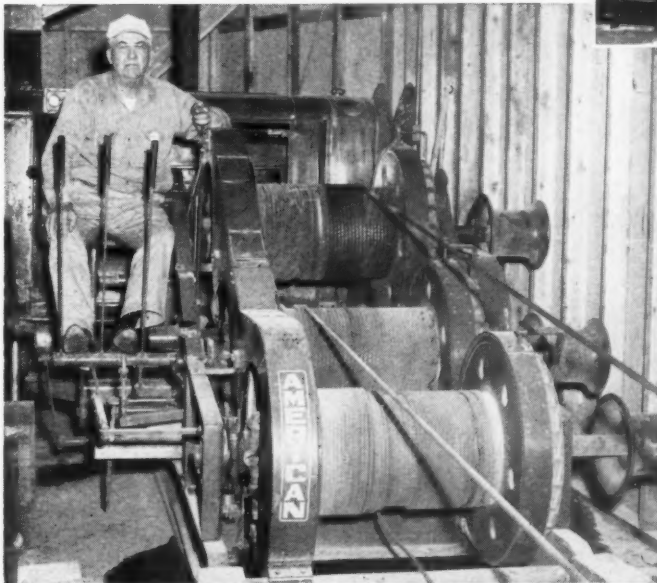


It's workhorse dependability on big jobs like this that makes American the number one choice of contractors! Your distributor has all the details about the complete hoist line that starts with capacities of 3,000 pounds single line pull!

AMERICAN 3-DRUM HOIST used by general contractor, Naugle-Leck of Minneapolis during construction of the 8-story bank addition.

AMERICAN HOIST
and Derrick Company

St. Paul 1, Minnesota



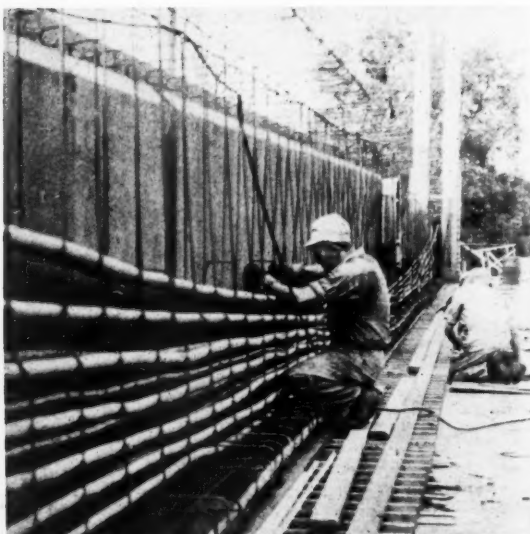
For more facts, use Reader-Reply Card opposite page 18 and circle No. 389

Long prestressed girders frame roof of gymnasium

**Hydraulic jacks stress girders,
then lift them into place;
prestressed connections make
rigid frame of girders, columns**

by RALPH MONSON, field editor

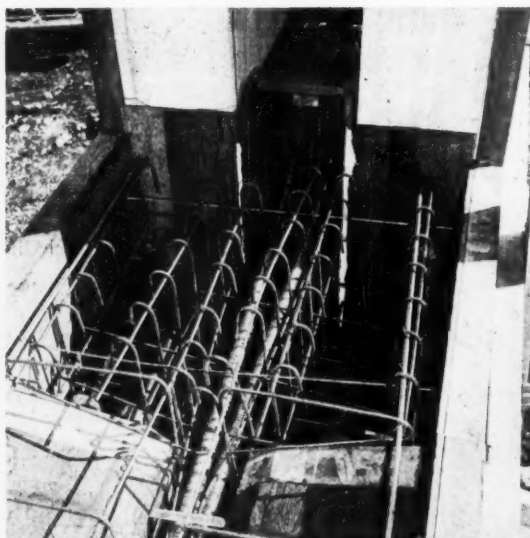
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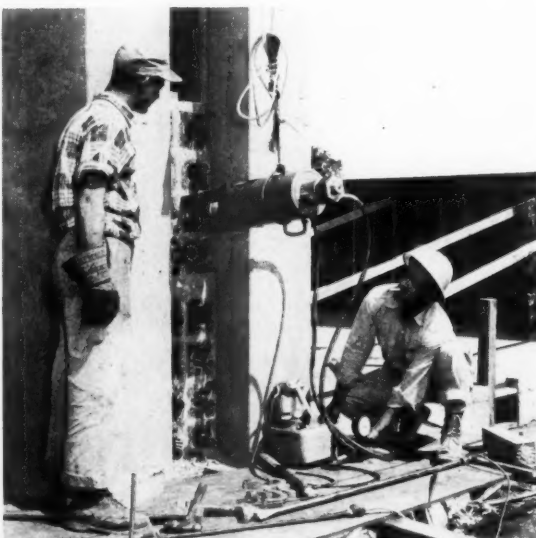
1. Preliminary work on the girders includes attaching 16 prestressing cables, each made up of Tufwire high tensile wires (0.25-inch), encased in Universal 1½-inch flexible metal hose. One side form is already in place.



2. As soon as cables and stirrups are tied, workmen set up the panels that form the second side of the girder. The 146-foot-long girders are 7 feet deep at the center and 5.5 feet deep at the ends.



3. A template with four Richmond 1½-inch anchor bolts—to be used by the lifting device—is in the end-block arrangement between the twin columns. Rubber cores in the end block form holes to be used in prestressing.



4. Seven days after a pour, cables are prestressed by a Templeton-Kenley Simplex 100-ton center-hole ram, operated by a Greenlee electric pumping unit. A total force of 98,400 pounds elongates the cables 10½ inches.

Unique twin concrete columns, tied by prestressed rigid joints to long prestressed girders, frame the roof for the auditorium-gymnasium of the new Parkview High School, scheduled to be completed the first of next month in Springfield, Mo.

Believed to be the longest precast, prestressed building girders ever constructed and erected in this country, they were cast and prestressed on the concrete floor of the gymnasium, then lifted into place with an ingenious arrangement that used the same powerful hydraulic jacks that were used to prestress the 192 quarter-inch reinforcing wires of each girder. When the 104-ton girders were in position atop the columns and the precast concrete roof deck was in place, wires providing the continuity of the joint between the girder and the columns were placed and stressed.

Construction and erection of the gymnasium roof girders was done by Prestressing, Research & Development, Inc., San Antonio, Texas, under a subcontract from J. E. Pyle Construction Co., Little Rock, Ark., general contractor for the \$1.5 million high school. Separate mechanical and electrical contracts were awarded to C. Wallace Plumbing Co., Inc., Dallas, Texas, and Roper Electric Co., Inc., Springfield.

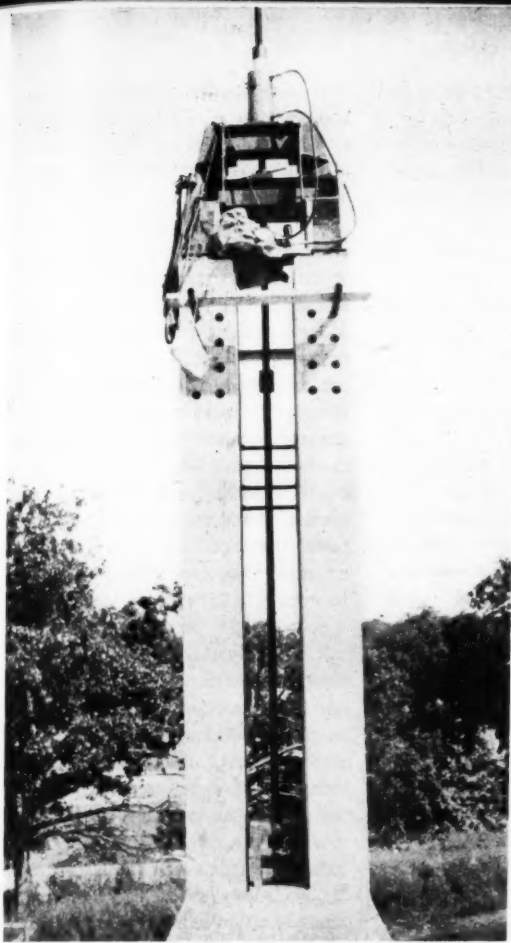
Planned by architect Richard P. Stahl for the Springfield Reorganized School District No. 12, the school has a three-story main classroom wing, 400 × 38 feet, of reinforced concrete. A second wing, one and two stories high and measuring about 300 × 140 feet, houses such facilities as cafeteria, kitchens, and shops. Near the street entrance is a small theater seating 500, while at the rear of the site is the gymnasium-auditorium.

The gym measures 138 feet square inside the columns and has a clear ceiling height of 24.5 feet under the lower flange of the girders. This building is being finished with a wood floor, a stage, seating facilities, and folding partitions that will make it possible to divide the gym into as many as five smaller rooms. Locker, dressing, and storage rooms are also located in this building.

Both the foundations and floor of the gymnasium, and those in the other sections of the building, were constructed in a similar manner by the general contractor. Trenches for spread footings were dug to depths ranging from 3 to 8 feet with a backhoe used by the subcontractor on this work, McLean Construction Co., Inc., Springfield.

Footings were generally poured directly from ready-mix trucks. Where foundation walls were required, they were formed with Economy metal forms. Mall gasoline-powered vibrators consolidated the concrete in the

CONTRACTORS AND ENGINEERS



5. Prior to raising a girder, the hydraulic lifting ram is atop the upper beam of the lifting yoke, while the lower beam supports the takeup nut.



6. One of the girders nears the top of the columns. A 132-pound steel rail, inserted through holes at the sides of the columns, supports the girder until it is connected to the columns. A Patent scaffold tower provides access to the columns.

floor slab of the auditorium, and Whiteman power trowels did the finishing work.

Twin columns straddle girders

Pairs of concrete columns were built by the general contractor at the locations of the ends of the roof girders. Each column was 15 x 48 inches in section and 30 feet high. The two columns of each pair were separated by a 16-inch space which provided a vertical channel for the web of the girder during the erection operation.

Eight holes through the top of each column accommodated the prestressing cables that tied girder and column rigidly together. Near their tops, the twin columns were tied together with

four No. 9 reinforcing rods to prevent any possibility that the columns would spread during the lifting operation.

Girders, cast at a rate of about one per week, were formed right on the concrete floor of the gymnasium, directly below their final position, and with the ends of the webs between the twin columns. Each girder, 146 feet long over-all, has a clear span of 138 feet. Sections are 7 feet deep at the middle of the span and taper to a depth of 5.5 feet at each end. The upper flange of the I-shaped section is 3 feet 10 inches wide, while the lower flange measures 2 feet 6½ inches. The lower flange is constructed with a flat shelf to receive the precast-concrete channel roof

slabs. Tapered stiffeners join the upper and lower flanges.

At each end of each girder a section of the web projects beyond the twin columns. Heavy end blocks, built on both sides of the web, butted up against the columns. The prestressing units that passed through these end blocks and through the holes in the top of the columns formed the continuity of the connection between girders and columns.

Forms are re-used

After soffit boards for the girders had been set on 2 x 4 sleepers, laid on the concrete floor of the gymnasium, forms for the beam sides were prefabricated in sections and erected by

hand on the soffits. When the forms for one side of a girder were in place, the stirrups and other conventional reinforcing, plus the prestressing cables, were placed.

Each girder contains 16 prestressing cables, each cable made up of 12 Tufwire high tensile wires, 0.25-in. in diameter, enclosed in a 1½-inch Universal metal hose. The high-tensile wires have an ultimate strength of 240,000 psi.

At the center of the span, all of the prestressing cables were concentrated in the lower flange and the lower part of the web. Near the ends, the cables were distributed uniformly over the end section of the web. Thus,

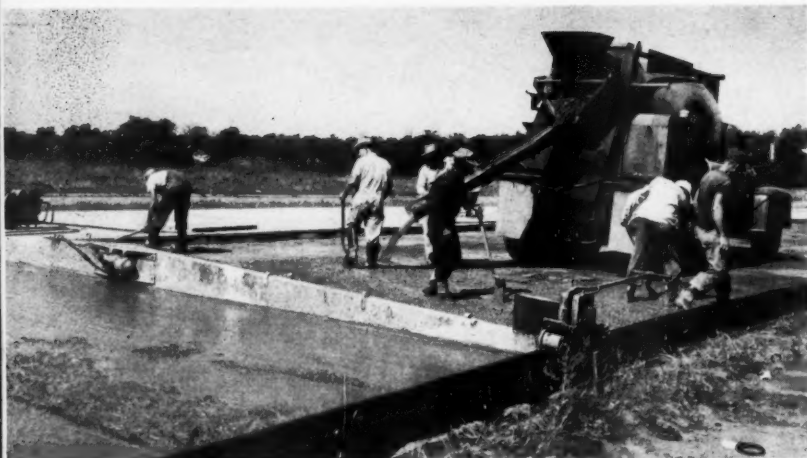
(Continued on next page)



7. A smooth ceiling is provided inside the building, since precast channel roof slabs rest on the lower flanges of the girders. Continuity stressing secures the columns and girders rigidly together. Grouting, at the ends of the girders, imparts a neat appearance.



8. Continuity cables passing through the end block of the beams and the twin columns are stressed with a Templeton-Kenly ram and TK Simplex pump.



The contract includes a concrete parking area. As concrete is placed from a Rex transit mixer on an International R-190 truck, workmen screed the slab with an Acme Foundry vibrating unit, powered with a Jackson electric vibrator and generator.

O&E Staff Photo

The Problem.....Move 16,000,000 Yards of Rock, Marine Clay, Boulders and Heavy Earth



again the answer was..... Firestone NYLON TIRES

In excavating the marine channel on Galop Island in the St. Lawrence Seaway, millions of yards of heavy boulder-strewn glacial till are being moved under the toughest haul road conditions.

The Galop Island project is well on its way and as on other Seaway jobs, Firestone nylon tires is the answer because they are tougher tires. They cut big downtime losses, give more retreads and keep tire costs at a minimum.

Firestone nylon tires are built for severe service. The

treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned Gum-Dipped nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.



A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

For more facts, use Reader-Reply Card opposite page 18 and circle No. 390

Copyright 1956, The Firestone Tire & Rubber Co.

(Continued from preceding page)

some of the cables hang in catenary-like curves, while others run practically straight through the length of the girders.

To hold these cables accurately in place during the concrete-placement operations, the contractor tied them securely to the stirrups of the girder. This was done before the final side of the girder form was set in place. The balance of the form was then set, tied with Universal form hardware, and braced from the gymnasium floor.

Between the columns at each end of the girder, four 1½ by 18-inch Richmond screw anchors were set into the web form. These anchor bolts were later attached to the lifting de-

vice to raise the girders into place. Rubber cores were placed in the forms for the end blocks of the girders to provide holes for the continuity cables.

The 5,000-psi concrete mix for the girders, supplied by Garrett Construction Co., Springfield, was delivered to the job in transit mixers. A Lorain truck-crane with a 90-foot boom and 15-foot jib used a ½-yard concrete bucket to transfer the mix from the trucks to the form. Mall electric vibrators worked the concrete down into the lower flange and web of the girders and consolidated it around the mass of reinforcing cables. One of the vibrators was equipped with a special 1¼-inch head to enable it to work in the confined spaces.

The top surface of the girders was sprayed with Hunt Process Clear curing compound, and side forms left in place for 24 hours. Then the forms were removed, and the concrete was sprayed with water frequently during the remainder of the seven-day period.

As soon as the side forms had been stripped, they were cleaned, re-oiled, and set up on a new soffit board for another girder. Soffits remained in place until girders had been stressed and hoisted into position.

Hydraulic jacks apply stress

When the concrete had cured for a minimum of 7 days, the main reinforcing was stressed by the Prestressing, Inc., method. The 12 wires of each cable were stressed simultaneously by a pair of powerful hydraulic jacks. On each end of each cable, a Templeton-Kenly Simplex 100-ton center-hole ram was set up to bear against the steel plate that had been cast into the end of the girder and to pull on the upset heads of the reinforcing wires.

A Greenlee hydraulic pump with a 10,000-psi capacity operated the big ram, applying a total force of 98,400 pounds to the steel. This resulted in a total elongation of approximately 10½ inches in the wires. While the jack maintained this pressure, the wires were locked in place by special split-locking rings that engaged the duplex heads on the wires.

After all of the cables in a girder had been stressed, pressure grouting was done to fill the remaining annular space within each of the cable sheaths. For this purpose, Prestressing, Research & Development, Inc., used a Colcrete grout mixer and a Colmono pump, both powered by Wisconsin engines.

The grout was a mixture of half portland cement and half fine sand, with the addition of ¼ pound of pozzolith per sack of cement. Enough water was used to make the mixture fluid. The grout was fed into the cables with a two-way grouting nozzle that made it possible for the grout to be forced into the cable or recirculated through a bypass back to the reservoir of the pump.

Same jacks lift girders

When a 104-ton girder was ready to be lifted 24.5 feet in the air, a lift-

CONTRACTORS AND ENGINEERS

ing frame was secured to the four Richmond anchor bolts in each end of the girder. Two-inch threaded lifting rods, extending well up above the tops of the columns, were then attached to this frame. A double-yoke arrangement, consisting of two short pieces of heavy beam, was placed on the tops of the columns to span the 16-inch space between them.

The top frame of the yoke supported the Templeton-Kenly Simplex 100-ton jack. The lifting rod passed up through the center hold of this jack and was secured to the jack by a large adjusting nut. The lower frame of the yoke supported a heavy take-up nut on the threaded lifting rod. This nut supported the entire weight of the girder while the stroke of the ram was being retracted after each 10-inch lift.

These lifting arrangements, one at each end, raised the girder in 10-inch increments to the tops of the columns. Then a short piece of 132-pound rail was inserted in a pair of holes in the twin columns to support the girder until the continuity prestressing could be completed. Once the girder was resting on the rail, the crane picked the lifting equipment off the tops of the columns and swung it to the next girder to be raised. During the lifting operation, which required about one 8-hour day, workmen used a Patent scaffold tower to gain access to the girder and the tops of the columns.

Precast roof-deck slabs

The roof deck between the girders was formed with 2 x 22-foot precast-concrete channel slabs supplied by the Carter-Waters Corp., Kansas City, Mo. The ends of these slabs rest on a ledge on the bottom flange of the girders so that only a portion of the lower flange of the girders projects within the building; most of each girder is above the roof line.

Alternate legs of the channel slabs of the roof deck had anchor plates cast into their bottom ribs to match similar anchor plates along the bottom flange of the roof girders. When the decking had been installed, these plates were welded together and the joints between the face of the deck panels and the girders were grouted to provide rigid lateral support to the girders.

Install continuity cables

After the roof panels had been placed and that portion of the dead load applied to the girders, the continuity cables were installed between the columns and the end blocks of the girders.

First, the joint between the faces of the columns and the end blocks of the girders was carefully grouted to provide uniform bearing. Then the cables were strung through the holes that had been provided in the columns and end blocks. Each of these cables consisted of 12 of the 1/4-inch wires of high-tensile steel encased in a 1 1/2-inch Titeflex steel sheath.

A Templeton-Kenly 60-ton ram, powered by a 10,000-psi hand pump, applied the stress to the wires. A total force of 1,570,000 pounds was applied to each joint through the

eight cables in each column.

These cables were grouted in the same manner as the main reinforcing cables. When this was completed, all exposed ends of the beam and column were carefully grouted to protect the exposed ends of the wires and give the frame a neat appearance.

The application of the built-up roofing to the roof deck and the construction of the masonry walls of the gymnasium were handled by the general contractor.

Concrete for the building frame was placed at an average rate of 1,000-cubic yards per month. Most of the

(Concluded on next page)

Most of the formwork for the concrete going into the rest of the structure was prefabricated at the site. Workmen in the general contractor's shop use a De Walt electric saw for this job.

C&E Staff Photo



NEW "KING-SIZE" CARTRIDGES SAVE TIME AND LABOR

Now, Hercules produces "King-Size" cartridges in lengths of 24, 20, 16 and 12 inches, and in diameters of 1 1/4, 1 1/2, 1 3/4, and 2 inches.

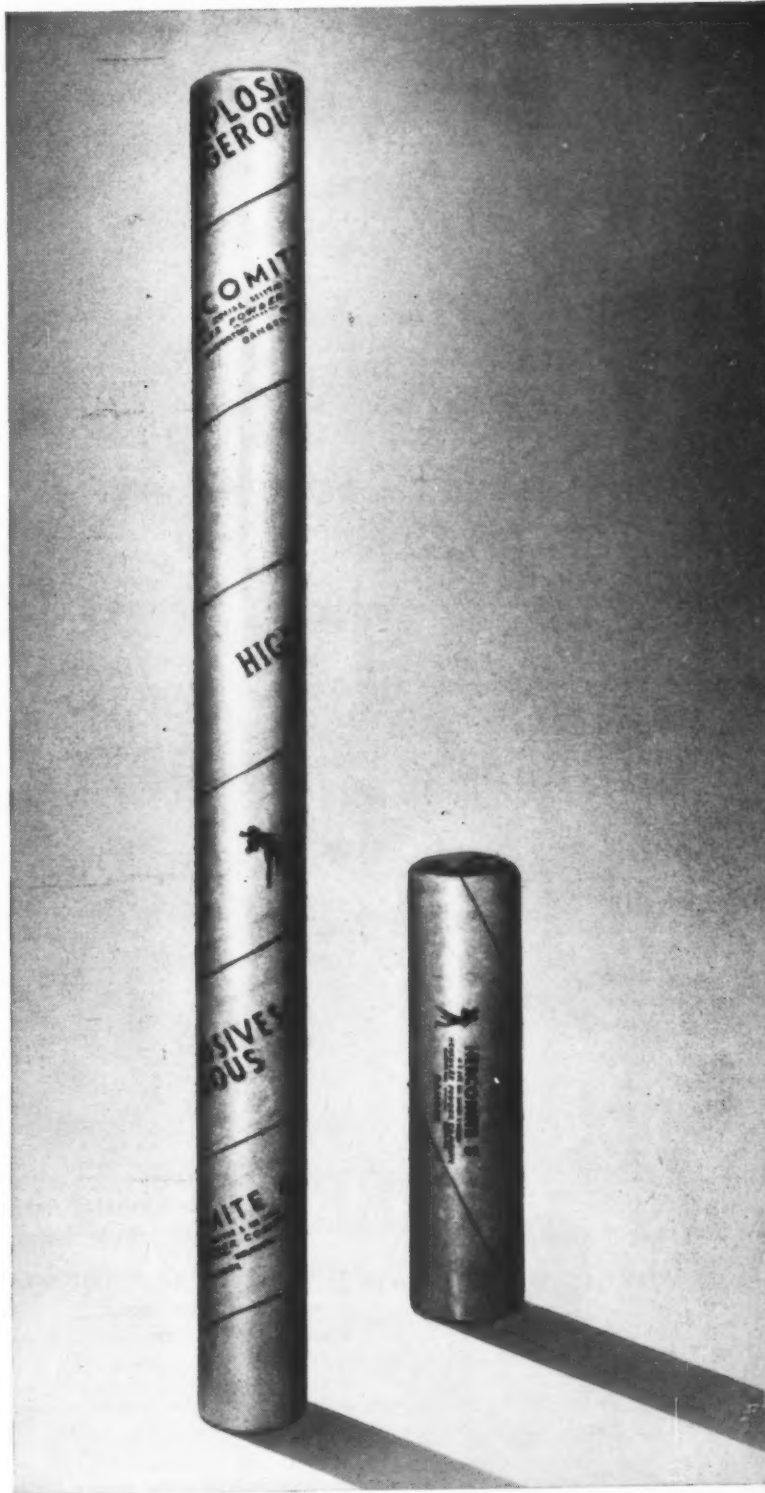
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 391

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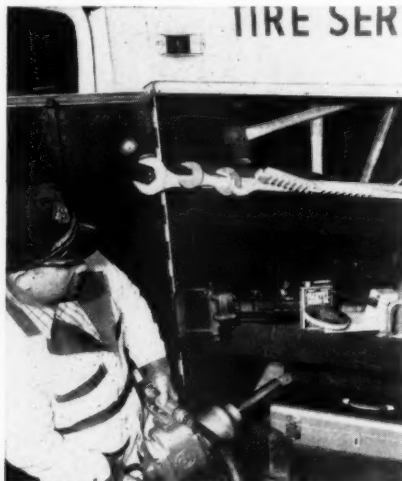


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(Continued from preceding page)

formwork for this concrete was precast and prefabricated by the contractor. Slab and beam forms, faced with 5/8-inch plywood backed by 2 x 6 joists, were supported from the floor by 4 x 4 wood shores.

A 2 x 6 ledger was spiked to the shores at the proper elevation to catch the beam bottoms. Another ledger, running parallel to the beams and between the shores, supported the deck joists. In this way, no shores were used directly under the beams, and the beam shores also supported the deck. Intermediate deck shores carried 2 x 10 stringers to support the deck joists. The system required practically no wedging or adjustment of the shores.

Personnel

Superintendent for J. E. Pyle Construction Co., the general contractor, is B. A. Mills. The construction and erection of the big prestressed girders was supervised by Royal U. English and the prestressed girders and columns were designed by Eric C. Molke, Prestressing Research & Development, Inc., San Antonio, Texas. The architect's superintendent on the job is Earl E. McDonald. THE END

Convention calendar

June 17-22 American Society for Testing Materials

Fifty-ninth Annual Meeting and Twelfth Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

June 18-20 School for Highway Superintendents

Course of Instruction, Cornell University, Ithaca, N. Y. Professor J. W. Spencer, highway research and extension engineer, Department of Agricultural Engineering, Cornell University, Ithaca, N. Y.

June 24-26 American Society of Landscape Architects

Meeting, Hotel Cleveland, Cleveland, Ohio. Ernest L. Dewald, general chairman, ASLA, 12910 Fairhill Road, Shaker Heights 20, Ohio.

June 25-29 American Society for Engineering Education

Meeting, Iowa State College, Ames, Iowa. W. Leighton Collins, secretary, ASSEE, University of Illinois, Urbana, Ill.

July 19 American Association of State Highway Officials

Meeting of Executive Committee, Fairmount Hotel, San Francisco, Calif. A. E. Johnson, executive secretary, AASHO, 917 National Press Bldg., Washington, D. C.

July 22-25 National Association of County Officials

Twentieth Annual Conference, Hotel Utah, Salt Lake City, Utah. Keith L. Seegmiller, executive secretary, NACO, 1616 Eye St. N. W., Washington 6, D. C.

August 10-12 Seabee Veterans of America

Meeting, Hotel Sinton, Cincinnati, Ohio. J. Bert Knille, past national president, 1214 Sliker Ave., Cincinnati, Ohio.

August 20-24 National Shade Tree Conference

Conference, Royal York Hotel, Toronto, Canada. L. C. Chadwick, secretary-treasurer, NSTC, Department of Horticulture, Ohio State University, Columbus, Ohio.

September 5-7 Virginia Highway Conference

Meeting, Hotel Roanoke, Roanoke, Va. R. P. Ellison, executive assistant, VHC, 1221 E. Broad St., Richmond, Va.

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Blown over by a high wind, its eye-piece buried in mud, this F/S automatic level needed only minor adjustment to be put back in top condition.

Case history

Level virtually undamaged after wind knocks it over

On a highway construction job in Columbus, Ohio, an F/S Model 5172 automatic level was blown over by a high wind and the eyepiece was buried in mud. The instrument was returned to the dealer, who checked the compensator, made some minor adjustments, and returned the instrument ready for use in a matter of a few hours. No mechanical damage was sustained by the level.

The level is owned by Visitine & Co., Columbus, and is being used in the construction of a portion of the Columbus Expressway. According to the firm's project engineer "it has saved much field-party time, while costing no more than a conventional level."

For more information on the F/S automatic level write to Pilotecnica Salmoiraghi, Inc., 41-14 24th St., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 189.

New 3 to 5-ton tandem has big-roller features

A new member of its line of variable-weight tandem rollers with torque converter—a 3 to 5-ton model—has been announced by the Huber-Warco Co. The new rig has many features usually found only on medium and large-size tandem rollers.

Among the features are a water-cooled, 41-hp engine; a spur-gear final drive; a large-capacity sprinkler tank; a continuous-member, all-welded frame; over-sized, double-plate clutches for forward and reverse shifting; all-welded, water-tight construction of rolls; and dual controls.

The use of a torque converter, standard on the 3 to 5-ton, is said to increase the life of the engine and other vital parts, and to help eliminate scuffing by providing constantly smooth reversing action. The converter also doubles available power and supplies it instantly when needed, decreases fuel consumption, prevents stalling or over-loading, and does away with the need for a master clutch.

For further information write to the Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio, or use the Request Card at page 18. Circle No. 151.

H. K. Ferguson opens new Florida office

An engineering office to handle industrial design work for new building in the South has been opened in Fort Lauderdale, Fla., by the H. K. Ferguson Co., Cleveland, Ohio. The new office will be staffed by about fifty engineers, designers, and draftsmen.

Ferguson specializes in the design and construction of chemical, petroleum, steel, and other industrial facilities.



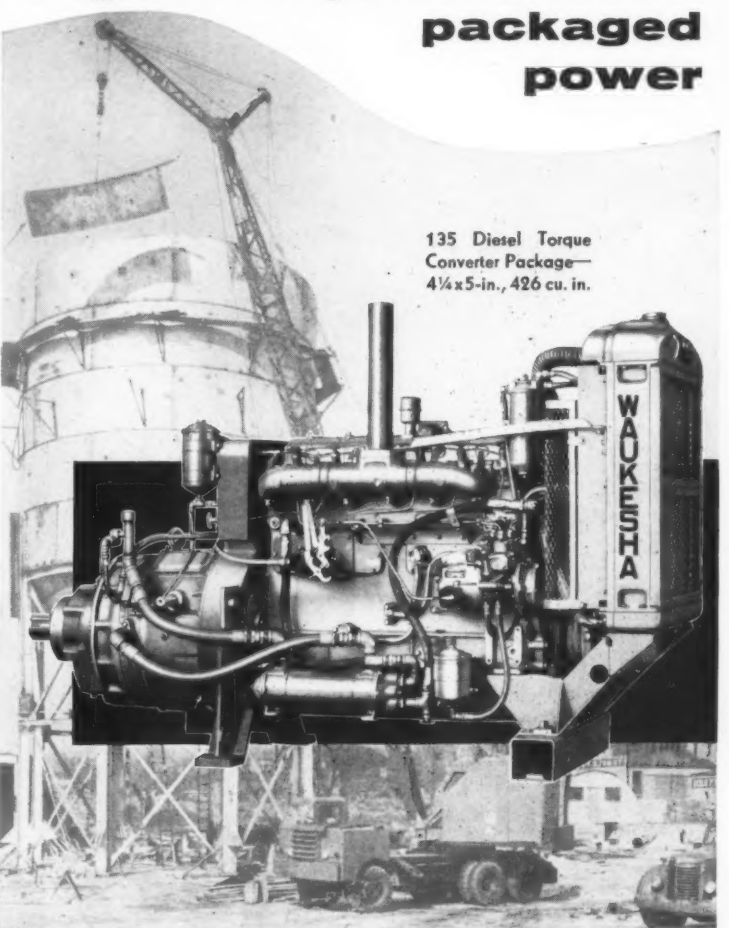
Material spreader

The Anderson Engineering Co.'s material spreader, Model D-1, is easily attached to the rear of a truck by removing the dump truck's tailgate, according to a mailing piece from the company. The literature states that separately-operated double-regulating gates vary the distribution of sand to each side of the spinner disk, thus providing a controlled spread to widths of 30 feet. It is claimed that the only wearing part of the unit is the single automobile tire which drives the spreading disk.

To obtain this mailing piece write to Anderson Engineering Co., 225 Bent St., Cambridge 41, Mass., or use the Request Card at page 18. Circle No. 44.

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engine torque converter packaged power



135 Diesel Torque Converter Package—4 1/2 x 5-in., 426 cu. in.

Diesel • Gas • Gasoline—20 hp to 1100 hp

for torque converter application in shovels, cranes and hoists; trucks and tractors—the result of Waukesha's 15-year development program in this field. Torque converters eliminate shock to driving and driven mechanism; prolong life of equipment; boost output work 10 to 40%. Power, automatically matched to the load, is delivered smoothly without stalling.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES





A mason fits a U-shaped cinder block over a spandrel beam on the first of the 40 buildings in the new \$16 million Levitt House apartment project.

Special cinder blocks trim building costs

**Lighter structural framework,
new 10-inch nailable steel joists
permit other economies**

**NOW . . . Get better
control of concrete set
during warm weather**



Construction progress photographs of Key West High School, Key West, Florida.

Architect: Wm. H. Merriam, Miami
Contractor: L. W. Ross, Miami

The use of specially-designed cinder blocks for finished exterior and interior walls, resulting in the need for a minimum of concrete-pouring equipment and labor, is producing substantial savings for Levitt House, Inc., in the construction of its 40-building housing development in the White-stone section of Queens, New York City, overlooking the East River and Long Island Sound. In addition, the lightweight blocks are permitting the use of a lighter structural steel framework because of the reduced dead weight load on the steel.

The special blocks were designed by Alfred Levitt, builder of the project, and are being manufactured by The Cincirete Corp., Long Island City, N. Y. They have been tagged with the name Levitt Shapes.

Cinders ground extra-fine

The Levitt Shapes are made from ordinary cinders. Unlike the aggregate used for regular blocks, however, the cinders are crushed and ground until they are extremely fine. This results in a high-density, smooth textured block which can be painted and re-painted like plaster and will hold nails and other fixtures. The 40 buildings will require close to two million blocks of assorted shapes. Except for the window areas, the structures are being enclosed entirely with the special blocks.

One block being used is solid except

use SONOTARD

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3. **Better finishes**—Denser surfaces are available because Sonotard permits greater facility in tooling, floating and troweling!
4. **Savings in materials**—Greater strengths permit extension of aggregates, or reduction of cement up to 15%, without sacrificing strength or workability!
5. **Greater resistance to moisture migration**—Permeability is reduced 25% to 40%!
6. **Sounder concrete and mortar**—Reduces bleeding and segregation!

For further information on SONOTARD simply fill in the coupon below!



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We are interested in further information on SONOTARD for better control of concrete and mortar mixes.

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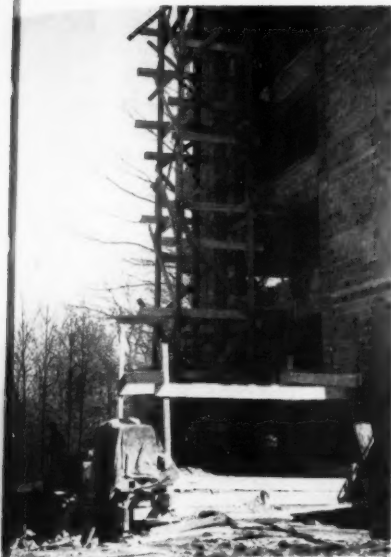
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FOR MORE FACTS



Specially-designed slotted blocks fit over the flanges of I-beams to enclose the structural steel. Interior walls are built of blocks in the standard hollow shape. The blocks meet all insulating and fireproofing requirements.

CONTRACTORS AND ENGINEERS

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 394



◀ A workman unloads the Levitt Shapes from a trailer alongside the building hoist used to lift the blocks to upper floors. A Lidgerwood hoist powered by a Chrysler 75-hp engine drives the hoist elevator.

With the special cinder blocks in place, the glass windows will be installed and the exterior painted. Rounded blocks are used at the corners of the buildings to carry out the modern design of the structure. ▶



for a 1-inch-wide slot. Designed for enclosing steel beams, this unit weighs 8 pounds. Four of these blocks will completely encircle an I-beam, with the flanges fitting into the slots. Another block, weighing 22 pounds, is a U-shape unit and is used for covering exterior spandrel beams. Exterior corner blocks are rounded to conform with the modern design of the buildings.

The interior walls, too, are being constructed with the special blocks, which fulfill all insulating and fire-proofing requirements of New York's municipal building codes. The solid, slotted Levitt Shapes enclose the steel framework, and standard-shaped, hollow blocks are being used between the beams in fashioning the wall panels. A smooth-textured mortar binds the blocks and blends with them to produce a continuous surface.

Trucked to job site

The Levitt Shapes are trucked from the Concrete plant on low-bed trailers in a shuttle arrangement. A trailer is brought alongside the hoist tower and is left there as a storage platform while the truck-tractor goes back to the plant for a second, loaded trailer. When it returns to the job site, the loaded trailer is uncoupled and the first low-bed, now empty, is hooked up for the return trip to the plant. The second trailer is then towed into position adjacent to the hoist. In this way, one truck-tractor and two trailers handle the supply operations.

The blocks are lifted to working level in a hoist tower built by the masonry contractor. The tower elevator, on a $\frac{5}{8}$ -inch cable, is driven by a Lidgerwood hoist mechanism powered by a Chrysler 75-hp gasoline engine. All hoist equipment is rented from Carlson Hoist & Machine Co., Inc., Flushing, N. Y.

Steelwork

The Levitt development is using only 50 per cent of the structural steel required in New York apartment buildings of comparable size. The steel is being supplied and erected by the Bethlehem Steel Co.

New 10-inch nailable steel joists fabricated by the Stran-Steel Corp., Detroit, Mich., are enabling Levitt to make his buildings eight stories high
(Concluded on next page)

For more facts, circle No. 395→



Here's new lower-cost protection for your light-load excavations

FOSTER LIGHTWEIGHT PILING—

delivered immediately to your job site

This is the most economical sheeting available for smaller excavation jobs . . . a piling you can use for short-cut tricks (such as driving to minimum diameter circles of 13'). This new Foster light-weight piling offers the greatest strength, pound for pound, of any light-weight piling made, requires no special rig or tools for driving. New box-type corrugation gives easier driving and easier recovery, lets you work faster . . . and the special interlock design won't jam, permits the simple locking of sheets together without sliding one into the other the entire length. With a new higher section modulus, you can use lighter gauge, less bracing, easier working conditions—thus benefit from lower all-around costs that make wood piling outmoded forever . . . for any job. You can pull and re-use this high-strength piling again and again. Immediate deliveries in any length from Foster warehouse stocks—Rental or Sale. Investigate these special advantages . . . get our quotation for your next job.

LB FOSTER co.

PITTSBURGH 30, NEW YORK 7, CHICAGO 4, HOUSTON 2, ATLANTA 8, LOS ANGELES 5

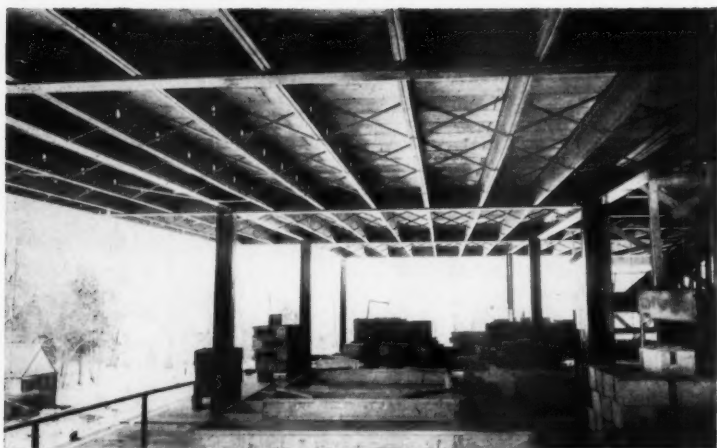
for: SHORE PROTECTION, SUMP PITS,
SEWER TRENCHES, CORE WALLS,
COFFERDAMS, CUT-OFF WALLS,
ABUTMENTS, BULKHEADS,
BUILDING EXCAVATIONS

Steel-Sheet Piling, Pipe for Piling,
and H-Bearing Pile,
Rails, Track Equipment,
Pipe, and Pipe Fabrication



handled by hand...

no special rigs



Steel joists 10 inches wide have reduced the height of the floors sufficiently to permit each building to rise eight stories and still be within the local zoning height limits. Precast 2 x 10-foot concrete slabs are nailed to the joists and covered with asphalt tile to form the finished deck.

(Continued from preceding page)

while still complying with the zoning height restrictions of the area. The use of conventional 12-inch joists would have limited the buildings to seven stories. Approximately 1,400 tons of the 10-inch joists were ordered for the \$16 million development.

Floors in the buildings will consist of 2 x 10-foot precast concrete slabs nailed directly to the Stran-Steel joists and covered with asphalt tile. The use of the precast slabs and the special cinder blocks has eliminated the need for forms, mixers, pouring, and other concrete equipment and labor.

The 40 buildings will occupy 18 per cent of the land at the site and will accommodate 1,280 families. Four

4½-room apartments will be on each floor, every apartment occupying a corner and having cross-ventilation. The ground floor will be used as a terrace and rainy-day playground.

THE END

Case history

Drilled pile foundation speeds powerhouse job

An all-drilled pile foundation in the Santa Ana River Valley floor near San Bernardino, Calif., has enabled the Fluor Corp., Los Angeles, Calif., to speed up first-stage work on the construction of a 240,000-kw steam powerhouse. The foundation consists of 140 drilled piles, 24 and 30 inches in diameter and from 50 to 65 feet deep.

The piles were designed on the basis of side friction and were not belled at the base. They are to be topped by a reinforced-concrete slab which will carry four 60,000-kw steam-turbine generators.

The drilling operations were subcontracted to the George F. Casey Co., Los Angeles. The Casey firm brought in two Calweld Model 150-A truck-mounted earth borers and planned a schedule of from 15 to 20 completed units each eight-hour day. As fast as the pile excavations were drilled, Fluor Corp. equipment installed reinforcing steel and dowel bars, and placed concrete.

The drilling machines exceeded their schedule frequently. A Hough Payloader was assigned to the job of removing the dirt as fast as the Cal-

Why Contractors Choose

ARMCO CORRUGATED METAL DRAINAGE STRUCTURES



A four-man crew completed this stream enclosure in 3½ days. The structure will replace obsolete bridge shown in background.



Earth fill and a 144-inch Armco MULTI-PLATE Pipe under 46 feet of cover carries a road across a wide gulley and small stream. The estimated saving over an alternate bridge structure was approximately \$200,000.

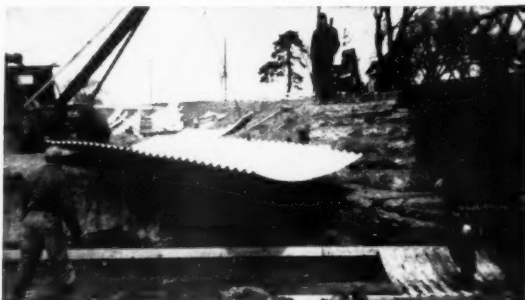


A small crew assembled this MULTI-PLATE Pipe-Arch alongside the streambed. It was then moved into position and back-filled immediately. The road was closed only 5 hours.

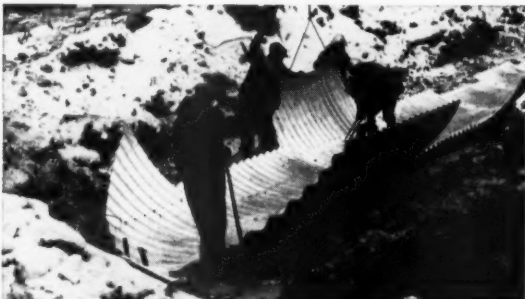
Naturally you are interested in low bids with adequate profit. This is why so many contractors choose Armco Corrugated Metal Drainage Structures. They require no costly formwork and no delay for curing. You can finish the job quickly, even with a small, unskilled crew and no special equipment—allowing your men and equipment to move on to the next job.

Long lengths of standard corrugated pipe and simple bolted couplers mean fewer joints, faster installation. Light weight makes for easy handling and hauling. For larger Armco MULTI-PLATE Structures curved, corrugated plates are quickly assembled on the job-site.

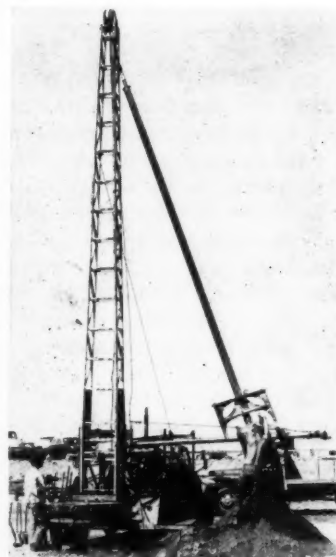
Write for more data on Armco Drainage Structures. Armco Drainage & Metal Products, Inc., 3306 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



A simple truck-mounted hoist was used to lift and position all the sections of this MULTI-PLATE stream enclosure. "Knocked-down" plates are easily handled with light equipment.



Sub-freezing weather did not halt construction because Armco Drainage Structures can be installed under adverse weather and foundation conditions.



A mechanical bucket puller made dumping easier on this Calweld Model 150-A earth drill. Two rigs were used to drill 140 piles for a powerhouse in the San Bernardino River Valley.

weld rigs brought it up, loading the material into Fluor dump trucks.

The Calweld drills had masts high enough to drill 46-foot holes, and used 24-inch-diameter buckets. Extensions were used on the masts to drill to the required depths. One of the machines was equipped with a bucket puller to facilitate dumping.

For more information on Calweld earth drills write to Calweld, Inc., 7222 E. Slauson Ave., Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 188.

ARMCO DRAINAGE STRUCTURES

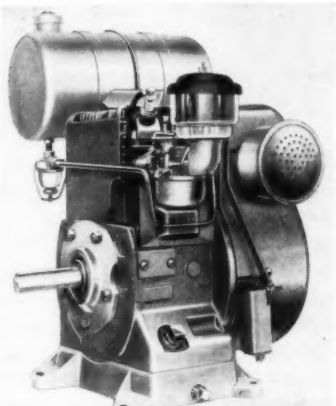


For more facts, use Reader-Reply Card opposite page 18 and circle No. 396

New one-cylinder engine develops 5.5 horsepower

■ A single-cylinder, four-cycle, air-cooled, gasoline engine that weighs 86 pounds has been announced by D. W. Onan & Sons Inc. The Model AJ develops 5.5 hp at 3,600 rpm.

The engine has a compression ratio of 6.25:1, a removable aluminum-



Onan's new Model AJ gasoline engine has a compression ratio of 6.25:1.

alloy cylinder head, and a counter-weighted balanced crankshaft. The standard model is started with a pull-rope.

Optional equipment includes recoil or electric starters; mounted fuel tank, fuel pump, and oil pump; rotating Stellite-faced exhaust valve and solid Stellite exhaust seat insert; and Onan's Vacu-Flo cooling system.

For further information, write to D. W. Onan & Sons Inc., University Ave. S. E. at 25th, Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 56.

Ibec Housing elects two new directors

The former vice chairman of the Raymond Concrete Pile Co., New York, N. Y., William V. McMenimen, has been elected to the board of directors of Ibec Housing Corp., also of New York. He was the chairman of the executive committee of Contractors, Pacific Naval Air Bases from 1939 until the end of World War II, and was most recently a member of the management committee of the joint-venture firms constructing military air bases in Spain.

At the same time, Nelson A. Rockefeller was elected to the board.

Ibec Housing is a subsidiary of the International Basic Economy Corp., an organization formed to promote economic development throughout the world by means of modern technology.

Safe-load slings

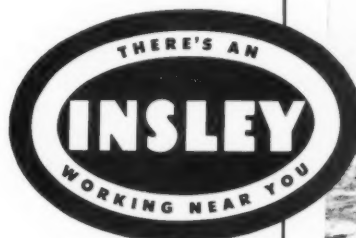
■ Safe-load slings in several models and sizes are described in a folder from the Macwhyte Co. The models shown are the round-braided Atlas sling, the flat-braided Drew sling, and the single-part Monarch sling. Complete specification charts detail each model.

To obtain Bulletin No. 5308-R write to the Macwhyte Co., 2906 14th Ave., Kenosha, Wis., or use the Request Card at page 18. Circle No. 136.

For more facts, circle No. 397→



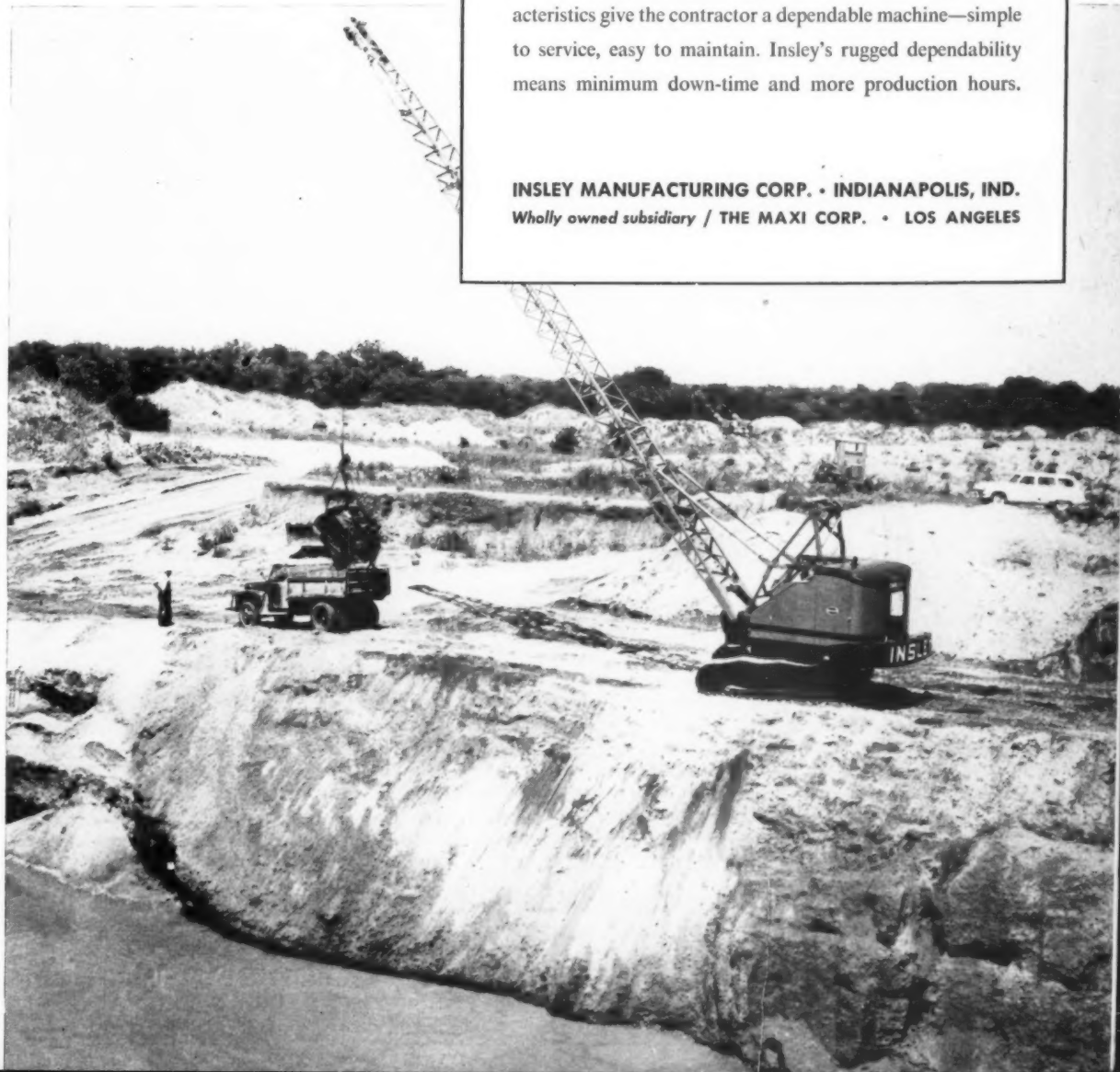
Case history: Mechanic Cliff Scarborough keeps a mixed fleet of earthmovers on the job for William J. Muehlenbeck, Saginaw, Mich., contractor, by replacing broken hose lines with Aeroquip assemblies made right in the field. Carrying only a small supply of socket-less fittings and hose in his service truck, Scarborough can fabricate new hose lines of any length in a matter of minutes. Aeroquip hose lines in some of Muehlenbeck's equipment have given uninterrupted service for more than two years. For more information about Aeroquip hose and fittings write to the Aeroquip Corp., 303 S. East Ave., Jackson, Mich., or use the Request Card at page 18. Circle No. 213.



INSLEY TYPE WB DRAGLINE

Recognized as standard equipment by highway contractors for excavating and trenching—Insley's proven design characteristics give the contractor a dependable machine—simple to service, easy to maintain. Insley's rugged dependability means minimum down-time and more production hours.

INSLEY MANUFACTURING CORP. • INDIANAPOLIS, IND.
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Two Caterpillar D8's push-load a Cat DW20 scraper working at the dam site. The Ateco ripper teeth on the rear tractor scarify hardpan and other hard materials encountered in the stripping operation.

C&E Staff Photo

Excess sand poses problem in aggregate production at dam

STRIP ACT AT ONLY 1200 RPM:

To join new and old bridge structures on the \$8,527,000 Spring-Sandusky Interchange, at Columbus, Ohio, required demolition of the existing deck. Seven air tools (3 medium sinkers, 3 heavy duty breakers and a heavy chipping hammer) were supplied by a Jaeger "600" Rotary which never ran faster than 1200 rpm. Visintine & Company, contractors.



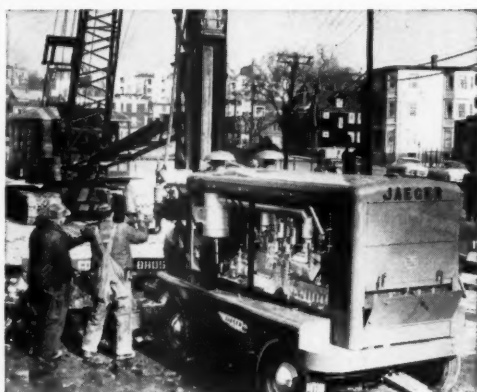
IDLING AT ONLY 900 RPM, on this road job, the Jaeger "600" Rotary is operating these four Thor "75" rock drills at 100 lbs. pressure. Under all ordinary conditions the same compressor will hold full pressure in two heavy duty wagon drills while operating well below its full load speed of 1650 rpm. "It's a windjamming sonofagun" says John Newman, Orco Construction president, Kirkwood, Mo.

Why air costs you less with a Jaeger Roto®

Full load speed of other "600" rotary compressors is as high as 1800 rpm. Full load speed of the Jaeger Rotary is 1650 rpm, using the same economical GM 6-71 diesel engine. This difference means that, for the lengthened life of your compressor, you will produce air with less fuel, with fewer feet of engine piston travel and up to 150 fewer compressor revolutions per minute.

Further improvement in efficiency results from Jaeger's closer regulation of engine and compressor to air demands. Speed modulation over the entire range is smooth and stepless, and so instantaneous as to prevent any over-run and racing of engine.

Jaeger "125" and "365" Roto Air Plus units offer comparably superior performance. For complete details, see your Jaeger distributor or send for Catalog JCR-5.



SMOOTH AS STEAM, AT A FUEL-SAVING 1200 RPM: A Jaeger "600" Rotary and Vulcan #1 hammer teamed up to drive 14", 80# H-beam piling to approximate 100' depth on Massachusetts' Northeast Expressway, at Chelsea. Never running faster than a fuel-saving, compressor-saving 1200 rpm, the compressor maintained a hammer speed of 60 blows per minute with average penetration of 1" per blow. Coleman Brothers, Corp., contractors.

Stripping 300,000 cubic yards of overburden to get at an equal amount of sand and gravel was only the first step in producing concrete aggregates for the Wesley E. Seale Dam project in Texas. In order to produce 134,000 cubic yards of sand and gravel in the sizes required for the dam concrete, the contractor had to waste more than half of the total volume as excess sand.

Adding to the cost of stripping and processing was a 20-mile haul to the job site by truck. This brought the total cost of the aggregates to a figure which in many areas would be unreasonably high. However, with the extreme shortage of concrete aggregates in the Texas coastal area, and with the nearest commercial source located some 85 miles from the job site, the cost of producing these aggregates was not out of line.

This aggregate-production operation was set up on the Nueces River, near Mathis, Texas, by H. B. Zachry Co., San Antonio. The completed dam will impound water for the Corpus Christi municipal water-supply system.

The sand-gravel deposit supplying the raw materials is an old river deposit in the valley of the Nueces River. It varies greatly in screen analysis from place to place, but since the excess of fines is a major problem, only the coarsest materials in the pit can be economically processed in this operation. This necessitates constant drilling and sampling throughout the area and the stripping and excavation of winding, irregular-shaped pits.

Scrapers handle stripping

A pair of Caterpillar DW20 scrapers aided by two Cat D8 tractors stripped a big share of the overburden. Unless one of the tractors was needed on other work, the D8's doubled up to push-load the scrapers, so that a heaping load was picked up in a short run and in a short time. The fast scrapers hauled an average of 1,100 feet to waste areas, getting back to the loading cycle quickly enough to keep the push-tractors busy.

A dozer-equipped tractor worked around the plant and pit, while another tractor with a push-plate on the front and a rear-mounted Ateco ripper scarified hardpan and other hard or cemented materials. A push block at the rear of the dozer-equipped rig permitted double push-loading.

Where it was economical to simply cast the strippings to the side, a drag-line was used. The average depth of



THE JAEGER MACHINE COMPANY

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PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • LOADERS • TRUCK MIXERS

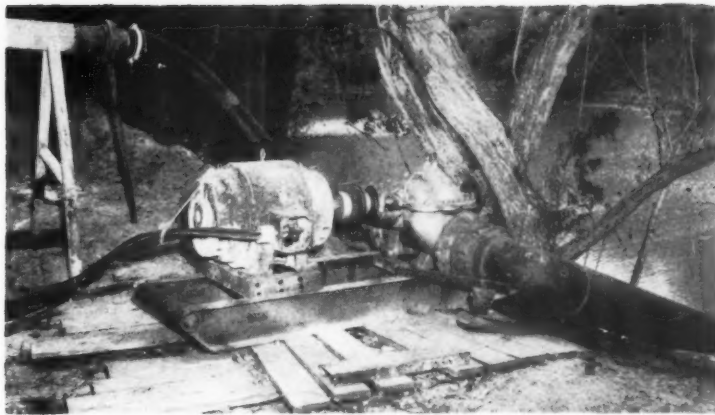
For more facts, use Reader-Reply Card opposite page 18 and circle No. 398

Only coarsest of materials

in pit can be processed;

push-loaded scrapers strip

overburden to 12-foot depth



Water for the washing and screening plant is pumped from the Nueces River by a Peerless split case pump. A 10-inch suction line from the river delivers water to the plant through 2,000 feet of 8-inch welded steel pipe.

C&E Staff Photo

overburden stripped was approximately 12 feet, and this uncovered a gravel deposit only 12 feet deep.

A sample of the pit area showed that the deposits which could be processed economically were very irregular in pattern and shape. Advance mapping of the area to be excavated was difficult, but as the work progressed, one deposit seemed to lead to another, and before the operation was completed, the area looked as if some gigantic mole had been burrowing through it.

Belts feed plant

Material from the pit was excavated by a dragline and loaded into a fleet of Ford trucks with 5-yard dump boxes. Since this was essentially a sand-handling operation, this type of equipment functioned efficiently. To facilitate truck operations, haul roads throughout the area were carefully maintained by a Caterpillar No. 12 motor grader.

The trucks climbed a ramp at the plant and dumped into a 15-yard surge hopper, from which the material flowed to a stub conveyor leading to the main plant conveyor. A shop-built unit with a 36-inch belt, the conveyor carried the materials 100 feet to the primary screen at the top of the plant tower. This primary conveyor was inclined at an angle of 32 degrees with the horizontal.

In order to keep the materials on the belt, the sand and gravel were sprayed with water as they were deposited on the belt. This was especially helpful on windy days.

All of the material was fed to a Simplicity 5x14-foot triple-deck screen at the top of the plant. Material passing the 1 7/8-inch screen and retained on the 1/4-inch traveled by gravity directly to an Eagle 36-inch log washer with a 7x30-foot tub. From the log washer, it passed to a second triple-deck Simplicity 5x14-foot screen which separated the two coarse-aggregate sizes. These materials were then conveyed to a 45-cubic-yard surge hopper for loading into trucks.

The minus-1/4-inch material from the second screen and a portion of the minus-1/4-inch material from the primary screen were sent to an Eagle 20-foot sand classifier. A hand-operated splitter valve in the line carried the sand away from the primary screen and delivered a portion of the sand directly to the waste pile without further processing. If needed, this sand can later be run back through

the classifier and used. The splitter valve was adjusted to feed just enough sand to keep the classifier operating at its optimum capacity.

In the classifier, fractions of the sand in the 16 to 30-mesh range had to be removed so that the sand would meet the specifications. About 25 per

cent of the volume fed to the classifier was removed in this way.

The usable sand then flowed to an
(Continued on next page)

94 MILES OF PILING

**for munitions-handling
facilities**



**driven by
McKIERNAN-
TERRY
PILE HAMMERS**

The \$23,000,000 Sunny Point terminal built for the U. S. Corps of Engineers on the Cape Fear River near Wilmington, N. C., was designed to assure maximum safety in loading ammunition aboard vessels.

The facilities include three wharves, each 2,200 ft. long, resting on reinforced concrete piles with a total length exceeding 470,000 ft. and driven to a penetration to take 100 tons. Diamond Construction Company of Savannah, Ga., the contractor for

the wharves and approach trestles, used McKiernan-Terry Pile Hammers for all pile-driving operations on this critical project.

Contractors all over the world similarly depend on McKiernan-Terry pile-driving equipment on foundation work for every conceivable type of job. Write for bulletins describing the details of design and performance records that explain this wide preference for McKiernan-Terry Pile Hammers and Extractors.

McKIERNAN-TERRY CORPORATION **MANUFACTURING ENGINEERS**

82 Richards Avenue, Dover, New Jersey
PLANTS AT HARRISON, N. J. AND DOVER, N. J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 399



McKiernan-Terry 11-B-3
Double-Acting Pile Hammer



After material has passed through the Simplicity triple-deck screen at the top of the plant, two sizes of aggregate are carried by belt conveyor to the 45-yard bin (foreground). Another conveyor delivers material to trucks for hauling to the site.
C&E Staff Photos

The Insley crane with Page ¾-yard dragline bucket casts sand away from the plant and an Allis Chalmers HD-15 tractor with a Baker dozer pushes the excess out of the plant area. A sand and gravel pump was later installed to do this work.



Don't Stick Your Neck Out!



New Hercules Front Mounted Telescopic Hoist Gives You 1000 lbs. Extra Legal Payload

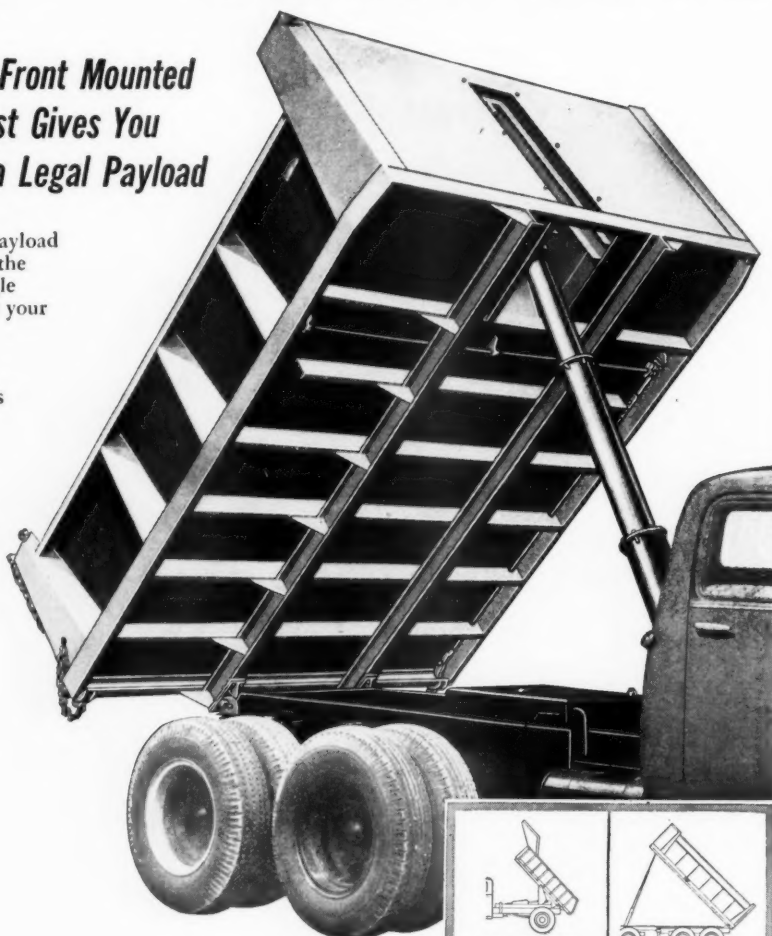
You can haul an extra half-ton of payload FREE on every trip by choosing the sensational new HERCULES Single Telescopic Hoist (Model 1210) for your heavy-duty dump truck bodies eleven to fifteen feet long.

This 20-ton capacity hoist pays for itself quickly because it weighs so much less . . . shifts more load to front axle . . . reduces driver cost per ton . . . and minimizes maintenance. Available for single or tandem axle straight trucks, Model 1210 mounts easily, no part extending below the truck frame.

For larger capacities, HERCULES builds Twin Telescopic Hoists with even greater payload-boosting advantages.

Act now to increase your profits. Write, wire or phone for complete information.

AA-3312

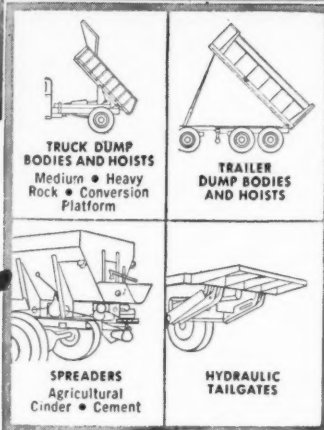


Hercules

buy from the line of strongest design

HERCULES STEEL PRODUCTS COMPANY • GALION, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 400



(Continued from preceding page)

Eagle 36-inch washer-classifier dehydrator which reblended the sand and removed much of the water. A shop-built conveyor carried the sand from the dehydrator, to a Barber-Greene stacker conveyor which placed it in a stockpile. After the free water had drained out of the stockpile, the finished sand was loaded into trucks by a Bucyrus-Erie 22-B crane with a one-yard bucket and hauled to the dam site.

Oversize is crushed

Oversize rock from the primary screen was conveyed to a 15-cubic-yard surge bin for storage. Since it represented less than 4 per cent of the pit-run material, oversize was not produced in sufficient quantities to keep a crusher in operation. Most of this small fraction was used as coarse aggregate.

When the surge bin was full, this oversize material was fed to a 15 x 36 jaw crusher, with the jaw openings set at 2¼ inches, to crack the hard-heads into usable sizes. A short conveyor carrying this material back to the primary inclined conveyor closed the circuit for this material. Once the bin was emptied the crusher was shut down, and it did not re-open until the bin was refilled.

The plant had not been in operation very long when it became obvious that the excess sand would have to be removed to a point some distance away or it would soon cover the plant. While permanent arrangements were being made, an Insley dragline with a Page ¾-yard bucket cast the material away from the plant and an Allis-Chalmers HD-15 tractor equipped with a Baker dozer pushed the waste pile farther back.

Pump handles excess sand

The real solution to this problem came with the installation of a pump to remove the materials hydraulically. A Pekor 8 x 10-inch sand and gravel pump was installed to pick up the waste from the sand classifier and the discharge from the splitter valve. Sufficient water was added to produce a workable consistency, and the sand was pumped out through an 8-inch pipe to a disposal area away from the plant and the material stockpiles.

Water, an important material in this aggregate-processing plant, is ob-

CONTRACTORS AND ENGINEERS

tained from the Nueces River. A Peerless split case pump powered by a 100-hp electric motor lifts the water through a 10-inch suction line and discharges it through 2,000 feet of 8-inch welded steel pipeline leading to the plant. Since there is no provision for storage, all water is supplied directly from the pump main.

This plant, all-electric in operation, takes its power from the local REA lines. The motors operating various units of the plant have a combined horsepower rating of 628.

Truck trailers haul 20 miles

Transporting of the finished sand and gravel from the processing plant to the dam site some 20 miles away was subcontracted to John L. Sullivan, San Antonio, Texas, who used a fleet of White trucks pulling Hamilton 15-yard trailers. These rigs, equipped with tandem axles on the rear of the trailers, kept within the permissible weight limits on the highways by loading the boxes about level with the sides.

A conveyor loaded the trucks with coarse aggregates from the 45-yard surge bin, doing it faster than the material was being produced and without using an intermediate stockpile. If the bins filled up and no trucks were available immediately, the material was hauled to stockpiles on the plant site in the 5-yard trucks.

Although the plant, under ideal conditions, produced materials at rates as high as 254 cubic yards per hour, the average production figures ranged around 170 cubic yards per hour. For this one job, the plant produced 40,000 cubic yards of $\frac{3}{4}$ to $1\frac{1}{2}$ -inch rock, 60,000 cubic yards of $\frac{3}{4}$ -inch rock, and 34,000 cubic yards of processed concrete sand.

Personnel

Supervising the entire dam-construction project for H. B. Zachry Co. is J. A. Downey. The production of the aggregate for concrete was directed by Fed Doyle, superintendent of aggregate production. THE END

New book treats problem of choosing building type

The problem of making an appropriate choice for the structural portions of a building and the procedure for determining the type of building frame, foundation, floor, roof, and wall construction most suited to a particular structure are discussed in "Architectural Construction", by Theodore Crane. Geographical location, site conditions, type of occupancy, equipment, and architectural design are considered in the solution.

The second edition of the book, the text offers a comprehensive view of the more useful types of construction and the newer features of building design in the United States.

Building codes and design standards are also discussed in detail. Photographs, charts, and diagrams illustrate the text.

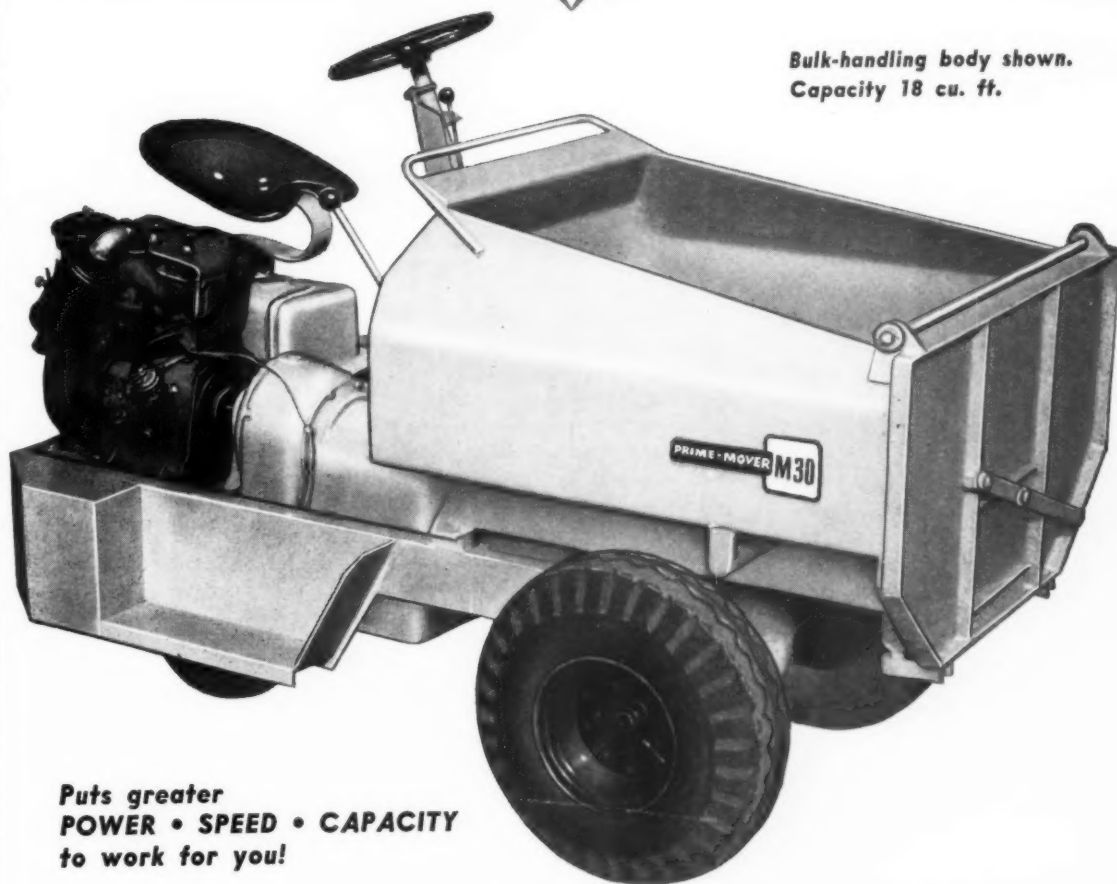
Priced at \$10, the book is available from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

JUNE, 1956

CAPABLE OF LIFTING 50 tons at a time, this Wiley fully-revolving floating crane takes riprap from boxcars on barge at left to construct artificial islands for the portals of the Hampton Roads Tunnel at Norfolk, Va. Equipped with a 100-foot boom and 10-foot whip extension, the crane is powered by a 12 x 14 four-drum steam hoist and a 72 x 144-inch 150-pound boiler. The rig is mounted on a 120 x 45-foot all-welded steel barge. Built for Merritt-Chapman & Scott Corp., contractor on this tunnel job, the crane is also equipped for hook work and pile driving. For further information write to the Wiley Mfg. Co., P. O. Box 97, Port Deposit, Md., or use the Request Card at page 18. Circle No. 169.



THE NEW PRIME-MOVER M30 WITH TORQUE CONVERTER DRIVE



Bulk-handling body shown.
Capacity 18 cu. ft.

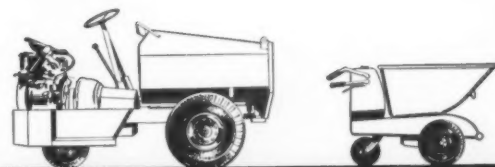
Puts greater
POWER • SPEED • CAPACITY
to work for you!

PROVED BY PERFORMANCE ON CONSTRUCTION

The M-30 delivers high production on your toughest handling jobs. Carries a ton-and-a-half load. Maneuvers in close quarters. Climbs steep grades. Travels fast.

Propelled by the exclusive Prime-Mover torque converter drive—no shifting—no clutching. You set the directional lever in forward or reverse—and step on the gas.

Let this husky truck with its dependable Wisconsin engine and smooth torque converter do more work for you. See nearest Prime-Mover distributor about your handling problems. The Prime-Mover Co., Muscatine, Iowa.



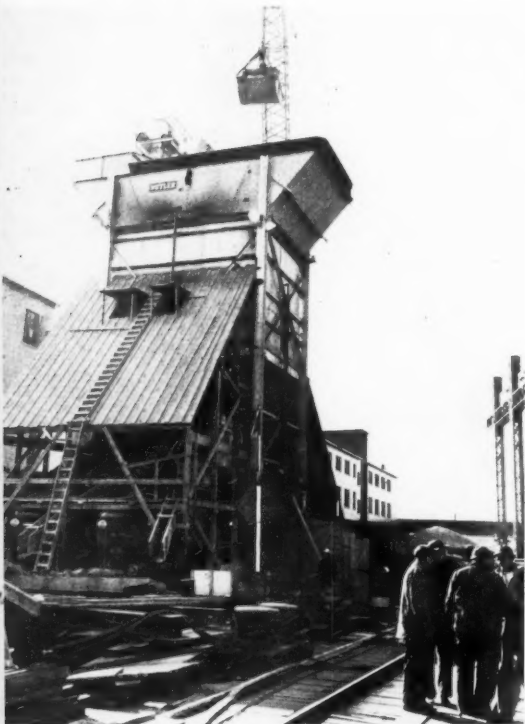
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Sidewall forms for the 300-foot-long tunnel sections are lifted to the 4 x 6-foot hatchways of a tube by two of the three gantry cranes working on the dock of the shape-up basin near the southwest end of the new project. *C&E Staff Photo*



This batch-mix plant at the end of the shape-up dock supplies concrete for interior work on the tubes. The Butler aggregate bin is being charged by a Manitowoc crane with 75-foot boom and 2-yard clamshell bucket. *C&E Staff Photo*

Gantry cranes ride on rails running the length of the long dock, where five tunnel sections can be moored. Concrete lines ride on top of the twin-tube sections, in the foreground, to men working within. *C&E Staff Photo*



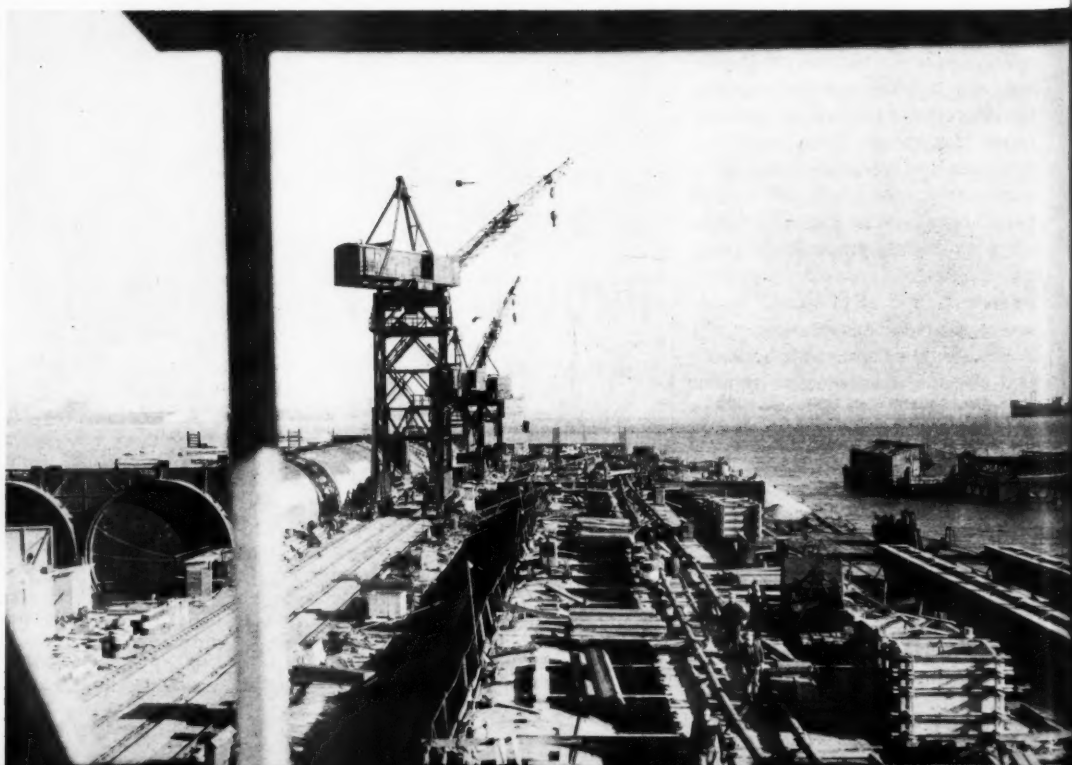
An aerial view of the Fairfield terminus shows the path of the Patapsco River tunnel. Almost completed is the tunnel approach (1) below the proposed toll plaza (2). Interior concrete for the tubes is being placed in the shape-up basin (3), which receives some sections from the fabricating yard of the Maryland Shipbuilding and Drydock Co. (4). One newly launched section (5) is on its way to the shape-up basin. Tubes are being sunk along the line of the tunnel (6). *C&E Staff Photo*

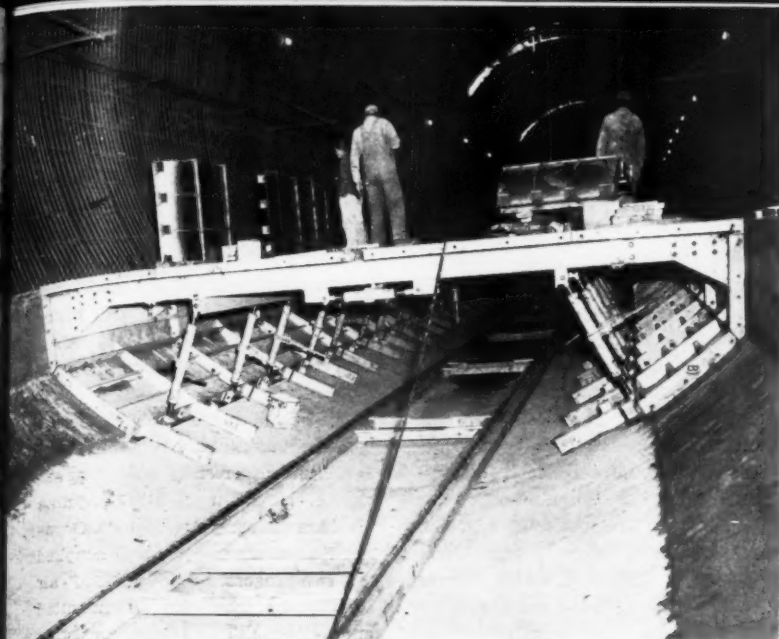


Concreting methods keep tunnel project moving

Special forms are used for interior work in Patapsco tunnel sections; concrete mix and tube interiors are heated during the winter months

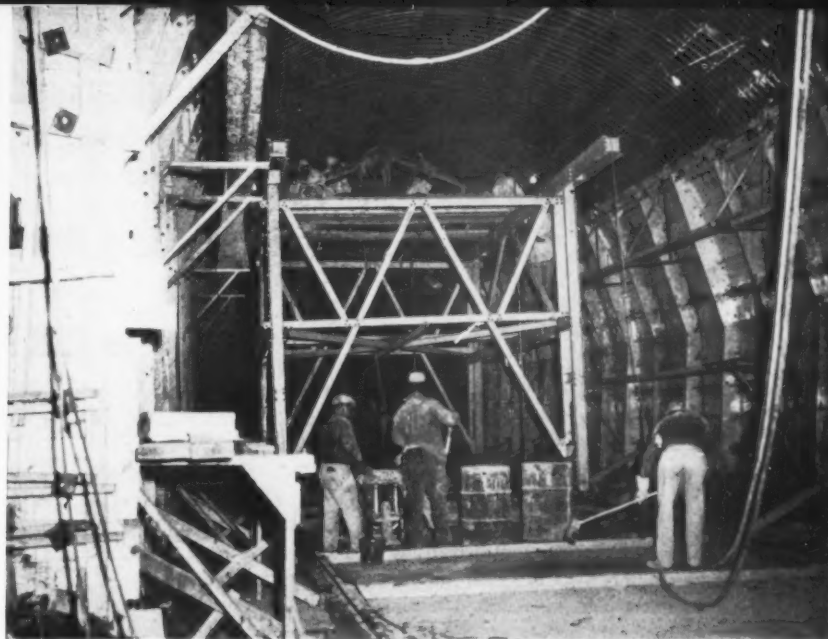
by ANTHONY N. MAVROUDIS, field editor





Special Blaw-Knox forms, in place for a haunch pour, have manually operated jacks to pull them from the concrete. A jumbo, riding rails on the curved invert, is used to move the forms.

C&E Staff Photo



Self-supporting sidewall forms, 72 feet long, are used as a pour is made simultaneously on both sides of the tunnel. Concrete enters through hatchway at top of tube.

C&E Staff Photo

By continuing its shape-up operations during the winter months, Merritt-Chapman & Scott Corp., New York, N. Y., was able to sink the first of 21 underwater sections of the Patapsco River Tunnel in Baltimore Harbor on April 11.

A good deal of credit for keeping this job operational and on an efficient schedule during this time goes to the steel forms that were specifically designed for the concrete pours within the tunnel sections, and the methods of preheating the concrete mix and heating the inside of the tubes while work was in progress.

This M-C&S job, amounting to \$29,894,000, covers the 6,300-foot underwater section and ventilation shafts. It was awarded in March, 1955, and is the largest of ten contracts for the 9,400-foot tunnel. The crossing itself represents about \$50 million of the \$130 million, 15.2 mile project that is being built by the Maryland State Roads Commission to provide an express route around Baltimore.

The 300-foot twin-tube sections, which are being fabricated at three different sites, are delivered to the

shape-up basin near the southwest terminus of the tunnel to be fitted out with a concrete interior. Here, at the site of Bethlehem Steel Co.'s Patapsco Scrap Yard dock No. 1 in the Fairfield section of Baltimore, is a dock which is long enough to have three tunnel sections moored on one side and two on the other. Rails, running the length of the dock, support three gantry cranes used in yard operations.

Most of the interior concrete, delivered by a Pumpcrete system, is being placed at the shape-up point in prefabricated steel forms that have been specially designed for this project by Blaw-Knox Co. The ceiling slab and sidewalk will be installed after the tunnel sections are in place in the prepared trench under the Patapsco River.

Multipurpose forms

The multipurpose forms are self supporting, and a jumbo or traveler is used in erecting, stripping, or transporting them between quarter points. These design features were difficult to incorporate in the forms, which had to be kept to optimum size and built

so that the set-up time was held to a minimum. In addition, panels had to be small enough to pass through the 4 x 6-foot openings in the tubes, each of which has five such hatchways.

M-C&S is using a total of 12 sets of forms, each composed of two 36-foot sections, to construct the air ducts, sidewalls, and arch forms. Since the stability and trim of the floating tunnel sections has to be maintained at all times, concrete is being placed in equal amounts along the length of the double tubes.

Four sets of forms, each 72 feet long, are used at the quarter points in each tube for this operation. Concrete is then pumped through two lines, one leading to each tube. When it reaches a form, it is discharged at two diagonally opposite quarter points so that the longitudinal and lateral stability of the twin-tube sections is maintained. Immediately after this pour, the two Pumpcrete lines are positioned to deliver concrete to the remaining quarter point in each tube. All but the end section pours are made in 72-foot long forms. These end sections generally measure less than 72

feet and are the last to be formed.

The first pour made inside the tube is a 60-degree invert section that forms the bottom of the fresh-air duct. This is followed by pours that form the sidewall haunches of the fresh-air duct, the roadway slab, sidewalls of the tunnel, and the tunnel arch, in that order.

Jumbos used in erecting and transporting the Blaw-Knox forms for an air-duct haunch pour ride on rails laid on the invert section. The pour for sidewalls starts as Pumpcrete is discharged from the burlap-covered pipeline into a hopper located at one of the hatchways. The hopper, in turn, feeds a vertical pipe that leads to a divider. As concrete hits the divider, half of it goes to a chute at one side and half of it goes to a chute at the other side. On all other pours, a series of elephant trunks are used to divide concrete being placed.

The forms used to construct the air-duct sidewalls are also used to support the 15-inch-thick roadway slab pour. Manually operated jacks, an integral part of these forms, are used to pull the forms away from the haunches



A barge-mounted guniting plant, consisting of a Jaeger mixer, belt conveyor, and Cement Gun, supplies material for exterior protection.

C&E Staff Photo



The steel casing, wrapped with wire mesh to bond the gunite, is being encased with a sand-cement mix.

C&E Staff Photo

and the roadway slab. This is done with the jumbo under the forms to support them as well as transport them to the next pour location.

Heating tube sections

Whenever the outside temperature required the concrete mix to be heated, the inside of the tube section was also heated to prevent the freshly placed concrete from freezing while it was being cured. Hot air, furnished by Herman-Nelson utility air heaters powered by General Electric motors, was fed through the hatchways of the tube to keep the inside air temperature at a minimum of 50 degrees while concrete was being cured. The heaters, their number varying with the intensity of the cold, were located on top of the tube, and hot air was fed into the shell through a flexible line that hung down into the casing.

Concrete batches differ

The composition of concrete batches varies for different pours. Each batch for the sidewalls and roadway slab contains 763 pounds of cement, 1,550 pounds of sand, and 2,400 pounds of stone, all measured saturated-surface dry. The 6-inch ceiling slab, which forms the bottom of the exhaust air duct, has to have a strength of 2,000 psi before forms can be removed and a strength of 4,000 psi at 28 days. It requires a mixing consisting of 823 pounds of cement, 1,413 pounds of sand, and 2,450 pounds of stone.

The strength of each pour is determined after field cured concrete test cylinders are broken at random until the required minimum strength is found to have been reached. At that time, forms are removed. Concrete in the fresh-air duct haunches must reach a minimum strength of 500 psi before forms can be removed. The 22-foot-wide roadway slab, covered with burlap bags for a minimum of three days for curing, has to show a breaking strength of 750 psi. All concrete above the spring line, or the horizontal diameter of the tube, must have a strength of 750 psi before forms are removed.

Concrete for all the pours is mixed in two Worthington 1¼-yard 355 mixers, then pumped from the plant through two 8-inch-diameter lines by two Rex 200 double-acting pumps. Each has a capacity of 65 yards per hour. The Butler batch plant, consisting of the two Rex pumps, two Worthington mixers, a Butler aggregate bin, and a Butler 400-barrel cement silo, is all electrically operated by power purchased locally. Two Murphy diesel generators serve as standbys in case of power failure which is an important precaution in a Pumpcrete station.

Aggregates are delivered to the plant by truck and stored in three stockpiles, one for sand and two for 1-inch-minus stone. Stockpiles are maintained by a Hough Payloader with a 1½-yard Ehrbar front-end loader bucket. Bulk cement is delivered by rail, bottom-dump cars moving to a spur alongside the cement bin, where they dump cement over a screw conveyor. This brings the cement to the 70-foot high enclosed elevator,

which in turn, raises the cement to the silo.

The aggregate bin has four compartments, one for sand, one for cement, and two for stone. It is charged with aggregates by a Manitowoc crane with a 75-foot boom and a 2-yard clamshell bucket.

The enclosed cement compartment is charged by the bucket elevator. After batches of cement and aggregate have been automatically weighed, they are released by electrically operated controls.

Last winter, aggregates and water were heated before being mixed if the temperature dropped to 40 degrees and threatened to go lower. This was done by feeding water through a Littleford steam heater, then feeding live steam—furnished by a Lit-

tleford generator—into the aggregate compartments of the bin. The amount of live steam fed to the heater and the aggregate compartments varied, depending on the outside temperature—so that the concrete mix had a temperature of 60 to 70 degrees.

If the temperature was 40 degrees and rising at the start of a work day, no steam was used. This batch-plant setup, in its best day, pumped 602 cubic yards of interior concrete in eight hours. It is capable of pumping much more concrete, but pours within the tunnel casings are such that records will not be broken on this phase of the work. The maximum economical pumping distance for each pump is held to 1,200 feet, which is more than enough to reach any one of the tunnel tubes.

Steel casings gunited

While work goes on inside the tubes, M-C&S keeps a crew of men busy guniting the outside of the steel tunnel casings. Three-eighth-inch rods, first placed along the length of the tube on 2 to 3-foot centers, are held in place by Nelson blank nuts that are shot-welded to the steel plate. These rods are then covered with a wire mesh that provides backing for the gunite.

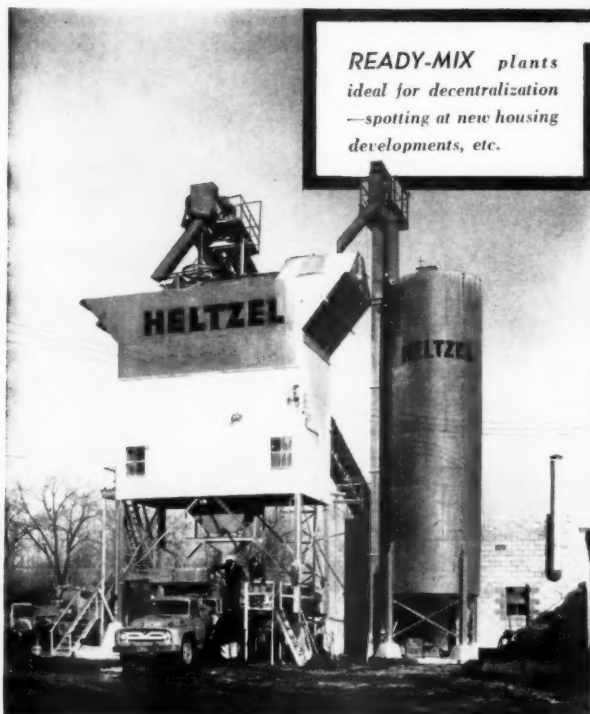
The gunite mix is supplied from a barge-mounted plant, consisting of a Jaeger mixer driven by a Hercules gas engine, and a Cement Gun Co. gunite machine that is powered by a Gardner-Denver air motor. Air is supplied by two Ingersoll-Rand K-500 air compressors, which are also mounted on the barge. The gunite, consisting

Heltzel Portable Batchmaster Plant

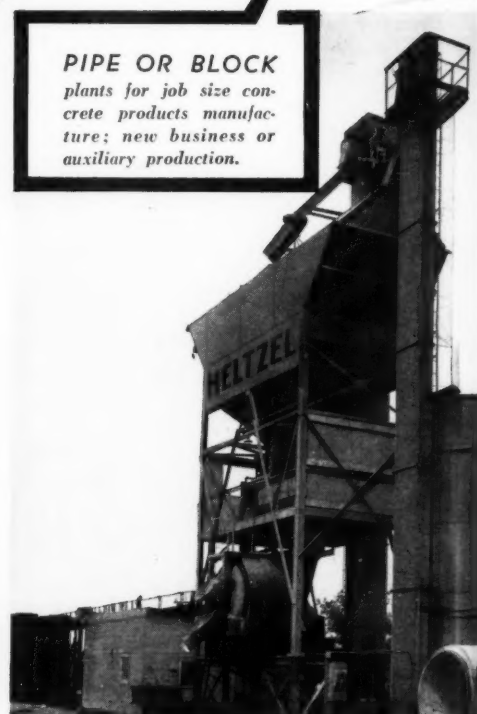
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of 94 pounds of Lehigh portland cement and 500 pounds of sand, is mixed in the Jaeger machine and transferred to the gunite machine by a belt conveyor. Water is brought through a separate line from the local water supply and is added to the mix at the nozzle of the gunite gun.

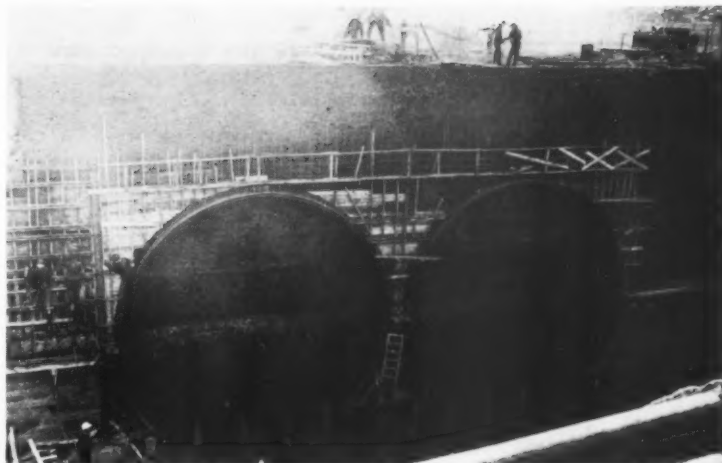
This covering is sprayed onto the tube at a pressure of 80 psi until it covers about 185 degrees of the top of the tube. It begins about 8 feet from the bottom of the tube, where a concrete keel is placed, and extends around the top of the tube.

As the twin-tube section is filled out with the interior concrete lining and the exterior gunite protection, its weight increases until—the shape-up operations complete—the 300-foot section has 18-inches of freeboard.

With almost a negative buoyancy, it is ready to be towed out to its location. As it leaves the shape-up basin, a tunnel section weighs an estimated 19,000 tons. Tremie concrete is later used to fill the area between the tubes of a tunnel section and make it sink.

Sinking tunnel sections

Before sinking the first 300-foot tunnel section adjacent to the Fairfield ventilation shaft, M-C&S brought in a dipper dredge to cut a channel from the river to the ventilation shaft bulkheads. These two bulkheads on the river side, together with the ring housings on the shaft, are identical to the bulkheads and rings on each end of the twin tubes so that they can be linked together to form the transition from the tunnel to the open roadway.



Two bulkheads, built into the river side of the ventilation shaft, duplicate those of the first tunnel section to be placed. This provides the transition between the open approach roadway and the tunnel.

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Before this operation started, the opposite face of the ventilation shaft was completely backfilled to prevent channel water from leaking through and disrupting approach-ramp operations. Two tractors, a Caterpillar D8 and an International TD-18 handled backfill material brought in on dump trucks.

When backfilling had been done and the trench excavated to design grade in front of the ventilation shaft, a screed barge moved in to begin lining the trench with a select sand and gravel material. The barge consisted of two pontoons, spaced far enough apart to allow the barge to straddle the open trench, tied together with steel trusses. Compartments of the pontoons were flooded with water so that the pontoons, just under the surface of the water, could be anchored to prevent them from being moved by tides or waves.

A movable screed of heavy steel members, designed to provide a trench of the desired width, rode on two rails, one of which was carried by each pontoon. Rails were positioned so that they were parallel to the designed grade of the trench and since the pontoons could not move, the screed cut the trench to correct grade at all times. This is the first time that this method of preparing an open trench has been used on so large a scale. Generally, a screed barge as well as the lowering barge are incorporated into one floating rig. Two separate barges were used in this case because this was the only way the contractor could use the double-pontoon setup of a screed barge to overcome the effects of tide and waves.

The lowering barge is actually two barges tied together with steel girders and spaced far enough apart to allow a twin-tube tunnel section to slide between them. After the first section had been towed from the shape-up basin and slipped between the two barges, divers placed lines under it so that the section was supported during the lowering process. Like other sections that will be on a grade, this one had additional concrete placed between the tubes at one end so that it tilted to the desired grade. This first section, sunk adjacent to the ventilation shaft, was lowered in a 3.5 per cent grade to correspond with the grade of the trench. Supporting



Concrete is placed for the Fairfield ventilation shaft by the Manitowac 3500 with 105-foot boom, right, while a Lorain feeds formwork into the shaft. The first section was sunk adjacent to the opposite face of this shaft.
C&E Staff Photo

(Continued from preceding page)

lines were adjusted so that the inclined section, paralleling the grade of the trench, could be lowered into place by means of winches and cables located on the barges.

A Blaw-Knox plant, located on one of the barges, supplied the tremie concrete that was placed between the tubes to sink the section. About 150 tons is being placed between the tubes of each section to eliminate the chance that a section will surface. This same plant is also supplying

concrete for the tremie cover seal over the top of the tubes.

As a section sinks, survey readings are made constantly and the tower masts checked to make sure that the section is at the proper alignment and grade as it comes to rest in the trench.

As soon as several sections have been sunk and joined, the exterior joints between the twin tubes are sealed by a tremie concrete envelope. This goes around the tubes and between adjacent bulkheads that have been connected by steel sheet forms installed by divers. Before this tremie seal is placed, the divers calk the bulkhead overlaps to prevent any tremie concrete from entering the tubes. The ventilation-shaft bulkheads will be cut away after three tunnel sections are linked, sealed with tremie concrete, and backfilled. This will allow completion of interior work between the shaft and the first tunnel section.

The open trench will be backfilled, after a few sections are placed.

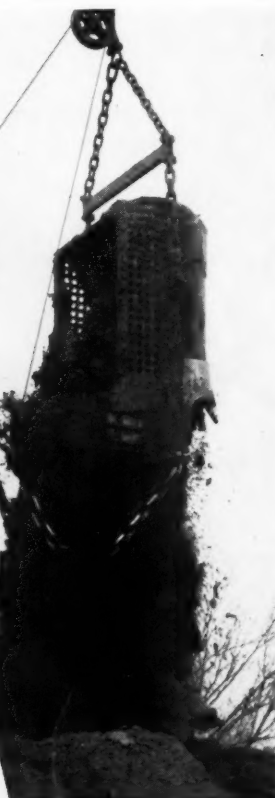
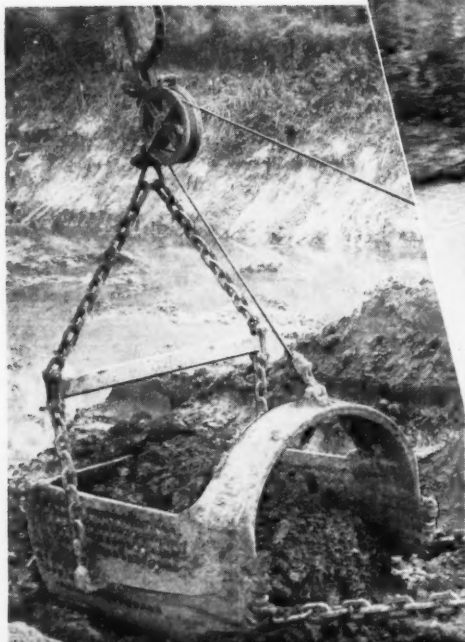
As the tunnel is extended across the river, bulkheads will be removed, one at a time, so that the interior concrete work between sections can be completed. A steel ring, placed at each joint between sections, will assure watertightness and allow the concrete lining and roadway slab to be placed, closing the gap between adjacent sections.

The Fairfield ventilation shaft, which will provide the transition from the open approach roadway and the tunnel, is approximately 50-feet deep and is supported on piles. The bearing piles were capped with concrete and topped with a thick concrete floor that forms the base of the ventilation shaft. There is a construction shaft at each end of the 6,300 feet of sunken tubes. At the south end, or Fairfield end, the ventilation building will be located over the shaft. At the north or Canton end, it will be offset about 50 feet west of the tubes because a rail line runs nearby.

These buildings will furnish fresh air to the tunnel, routing it through the air duct under the tunnel roadway. Exhaust fumes from automobiles will pass through openings in the ceiling slab that lead to the exhaust duct. Fans, motors, and transmissions required at each end of the tunnel will be furnished by American Blower Corp., Detroit, Mich.

On the land side of the ventilation shaft there will be a cut-and-cover tunnel section providing a transition between the open and tunnel roadways. The open approach roadways will have slab thicknesses varying from 2 to 15 feet, the latter thickness to overcome hydrostatic pressure caused by building the roadway below the ground water table. This was necessary for proper alignment between the approach roads and the tunnel. Wing walls, with watertight connections securing it to the roadway slab, will prevent water from

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seeping onto the roadway.

As soon as the 21 tunnel sections are in place and the ceiling slab installed, the 22-foot roadway slab will be topped with a 3/4-inch sand and asphalt cushion that will support the brick wearing surface.

Work on the 1.8-mile tunnel is scheduled for completion in December, 1957, when the remaining 13.4 miles of approach highway will also be completed. A toll plaza will be built on the Fairfield side of the tunnel to collect the 35 cent toll.

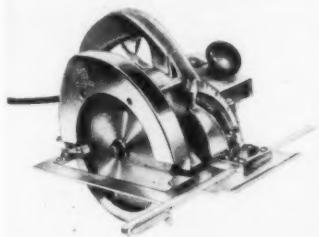
Personnel

The 15.2-mile Patapsco Tunnel project is being built by the Maryland State Roads Commission, which has Russell H. McCain as chairman. Edgar T. Bennett and Bramwell Kelly are commissioners. Norman Pritchett, M. ASCE, is chief engineer, Walter C. Hopkins, M. ASCE, deputy chief engineer, and the J. E. Greiner Co., consulting engineer, with Bruce Herman as project engineer.

Singstad & Baillie, New York, N. Y., the designer of the 9,400-foot tunnel, is also in charge of field engineering supervision and inspection, with E. V. Jones as resident engineer. Grover Denny is project manager for Merritt-Chapman & Scott Corp. THE END

Portable electric saw has telescoping guard

■ A portable 7 1/4-inch electric saw, driven by a universal motor that delivers 1 3/4 horsepower, has been added to its SpeedTool line, the Thor Power



The new Thor No. 475 SpeedSaw.

Tool Co. has announced. Designated as the Thor No. 475 SpeedSaw, the new unit features an automatic telescoping guard.

According to the manufacturer, the new model meets all standard requirements for sawing in its blade range, including quick wing-nut adjustments for depth of cut and for angle cuts to 45 degrees. There is a heavy-duty protractor for positive and accurate angle cuts, a cutting guide-notch to assure accuracy of cuts, and a rip guide.

Chief protective features of the unit are the automatically telescoping blade guard and a streamlined handle permitting safe withdrawal of the guard for plunge cuts. Gears are of helical-cut alloy steel and are sealed in grease, as are all bearings. The tool cuts to a maximum depth of 2 7/16 inches and a minimum of 1/8 inch. Maximum depth of cut when working at a 45-degree angle is 1 3/4 inches. The arbor is 5/8-inch round.

For further information write to the Thor Power Tool Co., 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 106.

Case history

Jeep-mounted trencher cuts accurate ditch

With a Go-For-Digger mounted on a jeep, a 1-mile curb trench 8 inches wide and 2 feet deep was dug so accurately in hard shale by a Houston, Texas, contractor on a job for the N. Y. State Natural Gas Corp., that it was necessary only to lay curb forms on the ground. The job, in Harrison Valley, Pa., was completed and concrete poured at a total savings of \$2,000 because of the accurate trenching.

The digging action of the rig comes

up over a spring-loaded boom and up against a shoe that rides on the ground. The dirt is driven into a hopper by the action of the cutters and holders on an R160 chain and then into a conveyor which dumps to either side of the ditch. The trencher and the conveyor are hydraulically-operated.

The highly-mobile rig is recommended for excavating for footings, conductor lines, bell holes, and for light dozing, in addition to simple trenching. The boom can be raised and shifted to the right or left to straighten the trench without repositioning the jeep. A hydraulically-operated dozer blade is used to prepare

the area and backfill the ditch.

For more information on the jeep-mounted trencher write to A. J. Parsons, 80 W. Maiden St., Washington, Pa., or use the Request Card at page 18. Circle No. 199.

Gardner-Denver expands Los Angeles branch office

A new office and warehouse at 7654 E. Slauson Ave., Los Angeles, Calif., has been opened by the Gardner-Denver Co., Quincy, Ill. The new building will consolidate activities formerly carried on in two company offices in the city. W. A. Nilsson is district manager.



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Back in 1920, the Ready management bought its first Mack to replace horse-drawn wagons. This chain-driven unit was retired only two years ago, after rolling up more than a million miles of heavy-duty construction hauling.

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asphalt, or 15 yards of earth, both on- and off-highway. Their Balanced Bogies with exclusive Mack Power Dividers enable them to work in mud and on rough terrain where other makes can't operate. Famous Mack Magnadyne engines furnish plenty of power to keep these heavy haulers on the move with the barest minimum of time-out for maintenance and overhaul.

Here's how Mr. Ready sums up their 36 years' experience: "Our Macks have been found to be rugged and economical, always dependable, and equal to any task."

That verdict on Macks is practically unanimous throughout the entire construction industry. Whatever you want to haul, wherever you want to haul it, Macks are built to get the job done on schedule, at the lowest cost per mile. Mack Trucks, Empire State Building, New York 1, N. Y. In Canada: Mack Trucks of Canada, Ltd.

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New technique extends grade in floating tunnel section

Simple device permits contractor to determine spring line of tunnel section by extending parallel plane along tube

One of the problems at the start of the Patapsco River tunnel shape-up operations was how line and grade at intermediate points within the tunnel tube sections could be determined. Since the tube was afloat, a transit could not be set up at one end so that lines could be extended to any intermediate point in the section.

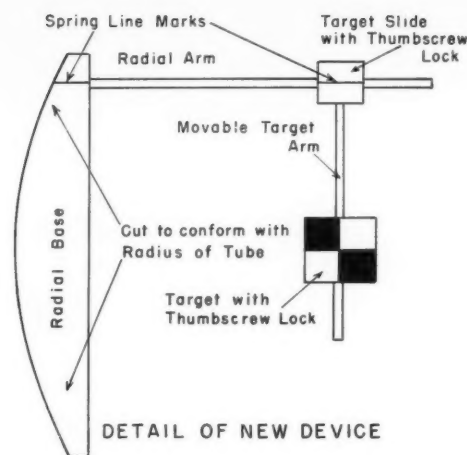
This problem was solved by the use

of a contractor-built device that can establish a parallel plane with the spring line so that a datum plane can be extended along the length of the tunnel tube. From this new plane, any point or elevation can be determined.

The device consists of a curved section that has an edge with a radius equal to that of the tube, a radial arm that projects from this curved section,

and a target arm that hangs down from the radial arm at 90 degrees to support a target. The target arm can be moved along the radial arm. The target itself can be moved up and down the target arm.

When a spring line is to be determined, the transit gun is set up at one end of the tube, at a known distance below the spring line, and sighted on



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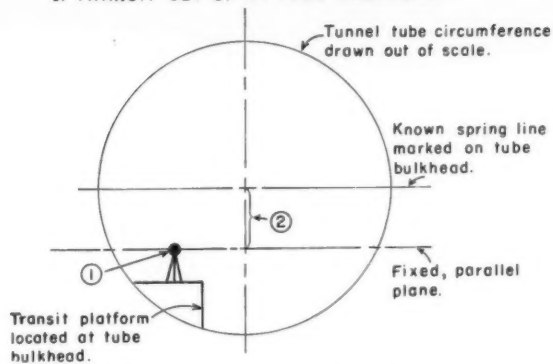


"IN SERVICE AROUND THE WORLD"

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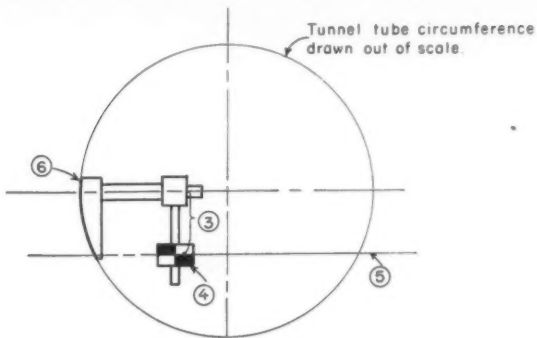
CONTRACTORS AND ENGINEERS

I. TRANSIT SET-UP AT TUBE BULKHEAD.



Steps: (1) Transit with scope locked in position; (2) variable distance measured from spring line to center of scope.

II. TO FIND SPRING LINE ANYWHERE IN TUBE.



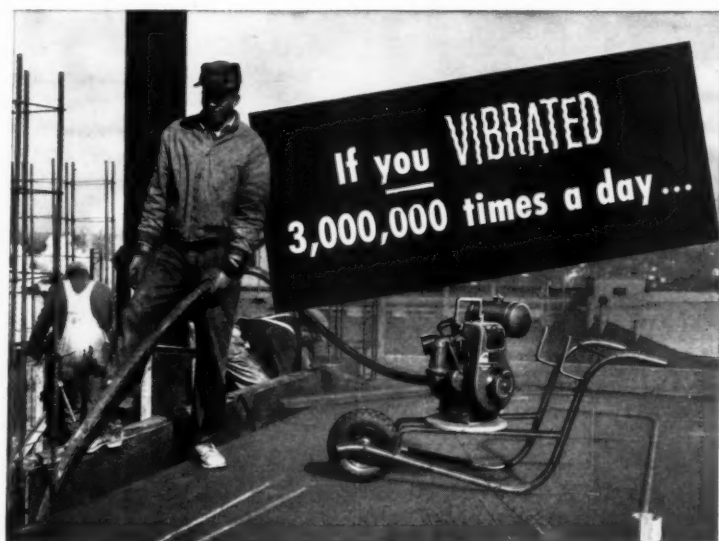
(3) Distance fixed to equal length between spring line and transit scope by adjusting (4) movable target; (5) new datum found by moving device until target lines up with transit sight; (6) spring line located at intermediate point by spring line mark on radial base of device.

a point at the other end of the tube, which is also marked off at the same distance below the spring line. Once the sight is made, the transit gun is locked.

The movable target is then set at a point on the target arm so that the length between the target and the center line of the radial arm is equal in length to the distance between the

spring line and the transit. Thus, whenever the device is positioned so that the target lines up with the transit sight, the radial arm center line of the device is at the spring line of the tube.

The device, constructed of aluminum so that it can be handled easily, was designed by Julian Smith of Merritt-Chapman & Scott. THE END



... you'd have to be rugged. Masters are.

Few pieces of equipment have to take this kind of a beating. 9,500 to 12,000 vibrations per minute against abrasive bits of stone, in wet cement. Imagine yourself inside one. Rough!

That's why it pays to buy *only the best* in vibrators... and why the *service* you get is just as important as the vibrator itself.

No flexible shaft vibrator is made with more care or better materials, than the Master... and our nearest distributor is ready with the service you want. He handles a complete line of gasoline and electric powered vibrators for any vibrating job. Try him. See for yourself.

For full information, specifications and prices on any Master product, see your Master distributor. There's no obligation... he's glad to help you.



Portable Gasoline



Lightweight Electric

MASTER VIBRATOR COMPANY
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MASTER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 407



HERE'S 33% LARGER
FLOAT AREA...

100% GREATER
FINISHING CAPACITY

NO BLADE CHANGING TO FLOAT AND TROWEL!

NEW 4-BLADE FINISHER floats or trowels without changing blades. With the Superior you adjust to the surface conditions by turning a crank to tilt or level the blades and... YOU GET A TRUER LEVEL FASTER with a Superior because its four blades do not adapt to an uneven surface (as compared to a 3-legged stool or a three blade finisher)... thus they work down the high spots faster and give a more uniform level surface.

TEST AND COMPARE the Superior with any other finisher and you'll find the pay-off is in its greater capacity... improved finishing... and easier handling.

NOTE THESE SUPERIOR FEATURES:



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Double arm braces with 4-point suspension provides greater stability and utmost accuracy.



EXCLUSIVE
Instant blade pitch control.



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Stationary guard ring for protection of walls.



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Sealed lifetime lubricated gear box and Timken roller main bearings.

Built in safety mercury switch. Two models—a size to suit any job.
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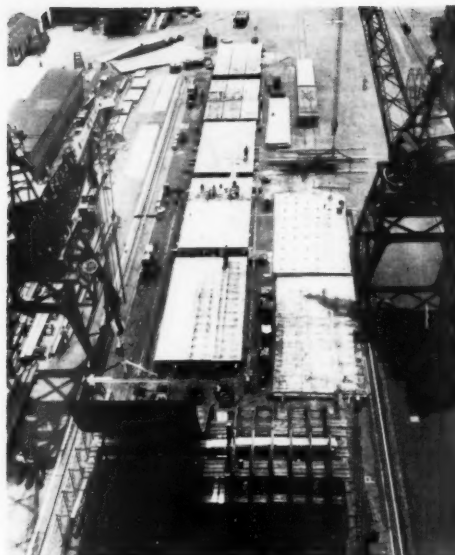


SUPERIOR
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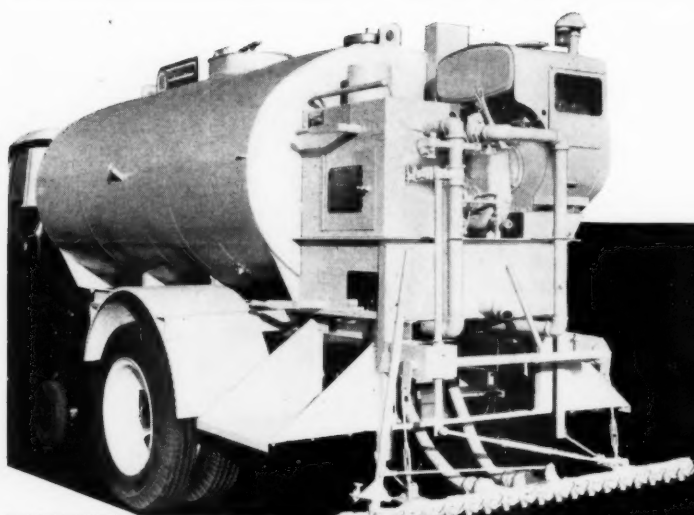
For more facts, use Reader-Reply Card opposite page 18 and circle No. 408



Varied procedures are used in fabricating tunnel tubes



Maryland Shipbuilding & Drydock Co. uses a 30 x 260-foot channel-steel table with wheel rollers on 2-foot centers to weld $\frac{3}{8}$ -inch-thick steel sheets into the 24 x 52-foot panel that forms half of a tunnel shell. As the gantry drapes the steel around the half-shell assembly form, the plate is clamped so that it retains its circular shape.



Utility spray tank for hand patching and bar spraying

With the complete line of Littleford black top equipment, there's never any compromise with your requirements. Nor do you ever have to buy a unit larger than you need.

The 101 utility spray tank is designed for contractors and municipalities doing a lot of patching including some bar spraying. It's ready for all your jobs whenever you want it, and without skilled operators. Truck mounted or trailer models, sizes 400 to 1000 gal. capacity. Write for bulletin 5.



LITTLEFORD

the right equipment for every job

tar and asphalt kettle for hand patching only

Where you're doing all hand patching and no bar spraying, the 84HD kettle is your best buy. Two patented features—the double heat circulation system and the screened reservoir—make the fastest, safest maintenance kettle on the market. Made in 3 models: standard, with hand spray attachment (below) and with motor spray attachment (left). Write for bulletin 1. Littleford Bros., Inc., dept. LB 223, 485 E. Pearl St., Cincinnati 2, Ohio.



world's most complete line of completely engineered black top equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 409



The 21 twin-tube tunnel sections making up the 6,300-foot underwater section of the Patapsco River crossing are being fabricated at three different places by three different firms using three different methods of construction.

Each of the fabricators has adapted existing yard facilities to the current job, so that operations in all three cases are being done at maximum efficiency. The sections being turned out have a total of nine variations to allow for the curvatures needed to fit changes in the grade of the trench dug in the riverbed.

Varied operations

Eight of the 300-foot-long sections are being made by Bethlehem Steel at Sparrows Point, Md. This is on the Patapsco River about five miles east of the shape-up basin, and the sections are being towed directly to the shape-up point.

Four of the steel casings are being fabricated by the Maryland Shipbuilding & Drydock Co., Baltimore, Md. These, built on the banks of the Patapsco about a half mile west of the shape-up basin, are also being towed directly to the yard.

The remaining double tubes are being constructed at Camden, N. J., by New York Shipbuilding Corp., a subsidiary of Merritt-Chapman & Scott. Once sections are completed, they are launched into the Delaware River, towed down the Delaware, through the Chesapeake & Delaware Canal, and down Chesapeake Bay to the Patapsco River and the shape-up basin.

N. Y. Shipbuilding job

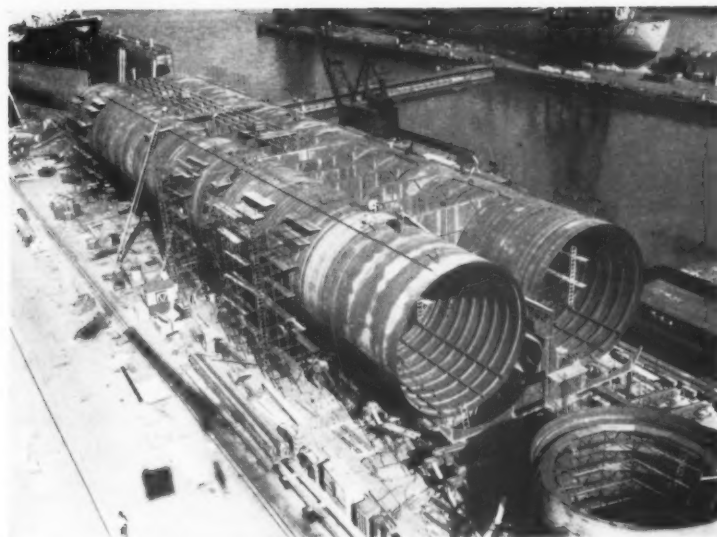
Methods formerly used to assemble rural water tanks are being used by N. Y. Shipbuilding in constructing the twin-tube sections. This process eliminates costly overhead welding and pre-rolling of the steel sheets for the tubes. In all, 18 units of steel casing, or nine double tubes, are being built, each of them about 300 feet long and 33 feet in diameter.

The fabrication of the 20-foot-long sections of tunnel casing is on an assembly-line basis. Fabrication begins when 9 sheets of $\frac{3}{8}$ -inch steel, each 6 feet 8 inches wide and 34 feet long, are laid flat on a huge deck to be welded into a single sheet. The work-

CONTRACTORS AND ENGINEERS

**Adapting existing facilities to the work,
fabricators use different methods to construct
300-foot-long twin-tube sections**

After two half-shells have been fitted and welded together on an assembly jig, lower right, the completed 24-foot-long section is added to one of the double tubes on the way. The 300-foot-long twin tube is braced or tied together, made watertight, and the keel poured before Maryland Shipbuilding launches the section into the Patapsco.



ing deck at this point is like an open loose-leaf book. When sheets have been welded together on one side, half the deck structure is swung shut like the cover of a loose-leaf book. As soon as cranes swing this half of the deck over the sheets, the entire unit is clamped together and turned upside down by the cranes. The section of deck corresponding to the back cover of a loose-leaf is then swung back so that the unwelded side of the sheet, which now measures 20 feet wide and 102 feet long, is exposed. After the seams are welded on this side for additional strength, the steel sheet is ready to be shaped into a 20-foot section.

The shaping process is done on a spool-like frame, the steel sheet being wrapped around the spool much as a rug is rolled up. Clamped onto the shaping spool are four T-bar rings which form the inside frame of the completed tube unit. The spool, with circular T-bars attached, is lifted by a crane and placed on its side at one end of the 102-foot sheet of steel. The T-bars are then squared with the sheet and welded together to assure proper alignment. While two air winches roll the spool forward slowly, the sheet is welded to the T-bars.

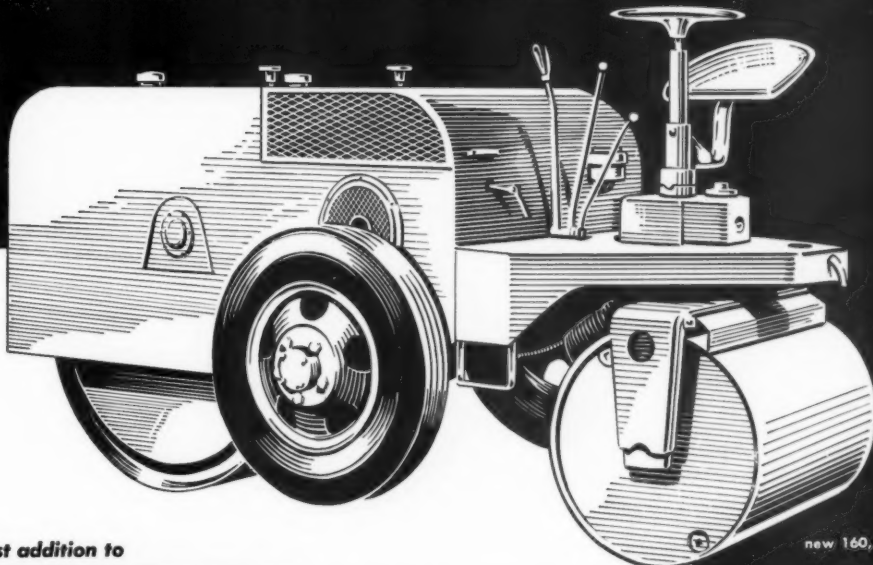
Removing the spool

After the two ends of the long steel sheet have been welded together, the clamps holding the T-bars to the spool are released and the spool is drawn out and placed in position for the next 20-foot-wide sheet. This sheet has been prepared while another sheet was being shaped. As soon as it has been removed from the book-like welding deck, work starts immediately on the assembly of another sheet. In this way, a sheet is always waiting to be shaped as soon as the spool has been removed from a 20-foot section of tubing.

Three 20-foot sections, joined end-to-end on the working deck, form a 60-foot unit that is hoisted to ways usually used for the construction and launching of ships. Here, the 60-foot sections are joined end-to-end to form a 300-foot tube. Each of the twin-tubes for a 300-foot section is constructed simultaneously in the same way, only two feet away from another one.

(Continued on next page)

NEW 3-5 TON ROLLER



latest addition to

LITTLEFORD

portable roller line

Out of the Littleford engineering and development center has come the latest addition to the Littleford portable roller line—the new 3-5 ton Model 160 . . . featuring

- ★ **the first complete power steering** that brings pleasure-car steering ease to this 5-ton giant. No difficult steering lever to grapple with. Mechanical steering in reserve.
- ★ **hydraulic lift.** Change from trailing-to-rolling-to-trailing positions effortlessly, hydraulically, with a flip of a switch. Wheels need not be removed.
- ★ **rolling with trailing wheels in position** . . . wheels move up to high position of 5" above rolling surface. Can be removed easily and quickly if necessary.
- ★ **compaction** when ballasted of 173 lbs./lineal inch on main roll, 91 lbs./lineal inch on small roll.

★ **maximum stability** provided by the 48" diameter x 38" wide main roll and the 30" diameter x 36" wide small roll.

★ **ease of maintenance.** Clutch located outside for easy adjusting.

★ **19.5 hp air-cooled engine** delivers plenty of power when rolling up steep grades and thru soft base material.

★ **2 speeds forward and reverse.**

Now, with the introduction of the Model 160, there's a Littleford portable roller for every requirement. Send today for descriptive bulletins. Littleford Bros. Inc., dept. LB 215, 485 E. Pearl St., Cincinnati 2, Ohio.



world's most complete line of completely engineered black top equipment

HYDRAULIC RAISING AND LOWERING



Unit in normal rolling position.

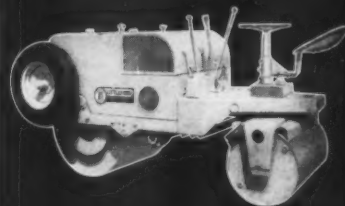


Hydraulic ram raises pulling tongue to engage towing truck pintle hook.

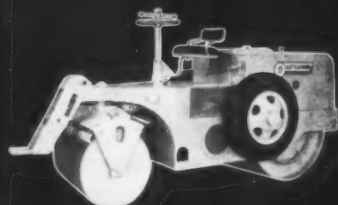


Pneumatic trailing wheels in trailing position with pulling tongue hitched to tow truck.

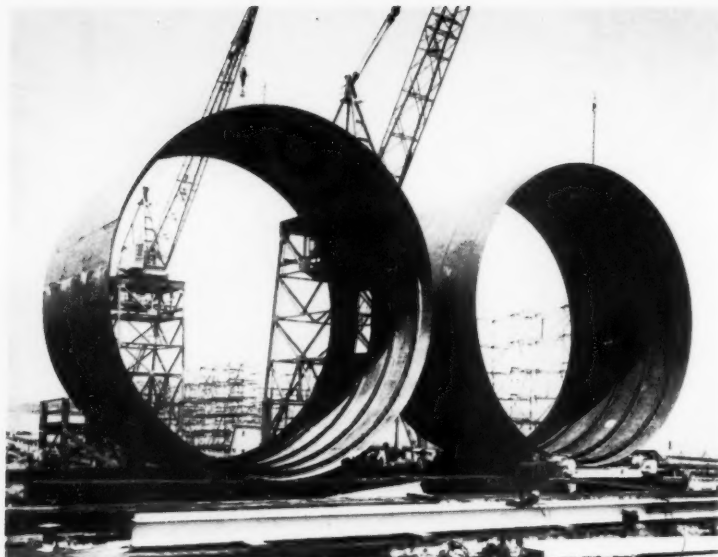
new 160, bulletin 32



Model 157, 2-3 tons, bulletin 24



Model 185, 4-6 tons, bulletin 20



Another method of fabrication is used by the New York Shipbuilding Corp. at a yard in Camden, New Jersey, on the Delaware River. Steel, wrapped around a spool much as a rug is rolled up, forms these 20-foot sections. Two more sections will be added to those on this working deck, and the 60-foot sections hoisted to the ways where the 300-foot long shell is being constructed.

(Continued from preceding page)

When both tubes have been completed and joined by a framework of steel, concrete is poured into forms beneath the double tube to provide a boat-like keel. This gives the section flotation stability while it is being towed and acts as a base when the section is placed in the prepared trench under the river.

This keel is approximately 3 feet

thick between the tubes, 1.5 feet thick below the tubes, and extends 8 feet up the outside of both tubes. Later, at the shape-up basin, gunite is applied about 185 degrees around the tube from the keel.

When completed, the units are sealed with a watertight bulkhead at each end and launched into the Delaware River for the trip to the shape-up basin.

Maryland Shipbuilding work

Maryland Shipbuilding & Drydock Co., which is constructing four of the twin-tube sections, has also developed an assembly-line method of production that is as unique as it is efficient. Raw material is received adjacent to a channel-steel table, approximately 2 feet high, 30 feet wide, and 260 feet long, which has a surface with wheel rollers spaced on 2-foot centers. Three 3-ton winches with cable and clamp attachments are required to handle the three $\frac{3}{8}$ -inch-thick plates, measuring 8 feet wide and 52 feet long, that are welded to form a 24-foot-wide and 52-foot long panel.

The shaping of T-bars for internal framing presented a problem if manufacturing was to be done on a mass-production basis. Special steel forms, clamps, and mechanical devices had to be developed and used in this operation so that standard dimensions could be maintained.

Twelve T-bars, six for each semicircular 24-foot tube section, are placed on a steel formwork and clamped at the correct spacing. This semicircular formwork that supports the T-bars is located at the end of the sheet-processing area so that the gantry crane in the yard can pick up the 24 x 52-foot steel plate and place it adjacent to the internal assembly form.

After the T-bars have been positioned and clamped to the semicircular internal assembly form, one end of the 52-foot-long plate is lifted by the gantry crane by means of special plate clamps and spreaders. The bottom of the steel panel is then positioned in the form and clamped to assure proper alignment during the shaping of the shell. The forward movement of the gantry, plus the weight of the suspended steel panel, forms the 24 x 52-foot plate around the T-bars on the assembly forms. As the plate takes shape as a half-tunnel shell, it is clamped to the T-bars so that it keeps its circular shape.

After two half-shell assemblies have been completed, they are picked up again by the gantry crane, and placed adjacent to the second-stage assembly jigs. Each of two half-shells is positioned on the assembly jig and the two seams, plus the T-bars, are fitted and welded. This jig, consisting of a steel lacework, gives a uniform circular cross section of each tube

Movalls Dump All Materials — Here's Proof



MARINE CLAY — Dutcher Construction turned to Movalls when gravity-dump wagons couldn't discharge the glue-like clay on his Seaway job; found them ideal, ordered more. Clay came out of scrapers in wheel-blocking lumps. Dozer-type ejector with 140,000-lb. push wipes every load out clean, eliminates buildup. Dutcher frequently uses one load to bulldoze previous loads. He now has 12 Movalls (rated capacity 25 heaped yds., 31 tons) powered by Caterpillar DW21 turbocharged tractors.



FROZEN EARTH AND ROCK — C. A. Pitts, Ltd., operates eight C & D Movalls powered by Cat DW21 tractors on Seaway job near Prescott, Ontario. Movall bodies are built for extra heavy duty, take shock of 6-yd. bucket loads of rock and huge frozen chunks without damage. Big 11' x 19' target area and low 8' height make for easy spotting and fast loading by shovel, dragline or belt loader.



WET SAND, GRAVEL — RD15 Movall, for use with Cat DW15 and DW10 tractors, has rated capacity of 16 yds. or 22 tons. Here it's discharging heavy load of wet aggregate into grizzly at controlled rate. Exclusive scraper-in-reverse design enables Movall to dump either standing still or traveling; operator controls action through standard Caterpillar controls.



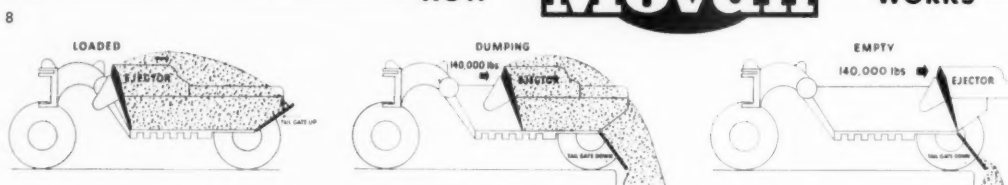
ROCK — Berlanti Construction Co., owns 5 Movalls, says, "Positive ejection enables Movall to handle rock, dirt, or sticky materials. Also we find it very adaptable when interchanging from Movall to scraper operation." Interchangeable yoke speeds changeover, permits Movalls to work behind several different prime movers.

SEE FOR YOURSELF. Ask your Caterpillar - C & D dealer NOW for a buy-and-try demonstration... or write C & D Division, Yuba Manufacturing Company, Perkins (suburb of Sacramento), Calif. Phone: GLadstone 5-8592.

HOW

**C & D
Movall**

WORKS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 411

so that it meets specification tolerances.

With the fitting and welding of the unit complete, the 33-foot diameter and 24-foot long section is lifted and positioned horizontally on the building ways, which are used for the construction and launching of ships. Here the sections are placed end-to-end to form the 300-foot-long twin tube and joined together by welders working from scaffolds. The two tubes, constructed simultaneously, are braced or tied together by external transverse framing on 12-foot centers.

The ends of each tube are closed by $\frac{3}{8}$ -inch bulkheads to make the unit watertight, and finally the keel pour made to allow the section to be launched into Patapsco River.

THE END

Desk-top base station for mobile radio setup

■ A new desk-top base station, featuring fingertip control without the use of control lines, has been added to the line of two-way mobile radio communications equipment offered by Allen B. Du Mont Laboratories, Inc.

The new Model MCA-155-B is a complete base station designed to meet requirements of dispatchers, foremen, superintendents, and project managers or engineers. The unit is 8½ inches high, 23½ inches wide, and 18 inches deep. Weight is approximately 50 pounds. It comes in Du Mont standard gray-green baked enamel hammertone finish, with a full line of accessories.

The frequency range of the MCA-155-B is a 25 to 54 megacycle, 40-watt minimum output. The same type base station is also available for 144 to 174 megacycles as the MCA-355-B, and for 450 to 470 megacycles as the MCA-455-B. The equipment complement includes pre-amplifier, built-in loudspeaker, desk-type microphone, and built-in multimeter.

For further information write to the Allen B. Du Mont Laboratories, Inc., 760 Bloomfield Ave., Clifton, N. J., or use the Request Card at page 18. Circle No. 148.

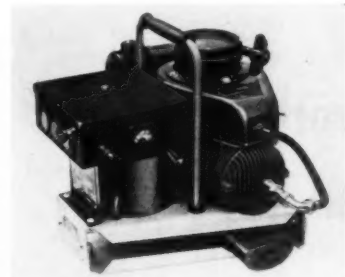
New transit-mixer line

■ Five new models added to the LeTourneau-Westinghouse line of transit mixers are featured in a catalog from the company. The mixers, with capacities from 4½ to 6½ cubic yards, are said to meet the specifications of the National Ready-Mixed Concrete Association. Pictured and described are the charging hoppers, mixing drums, discharge chute, single-lever control transmission, enclosed drum gear drive, self-aligning drum mounting, swing-away chute, power-takeoff drive, and roller assembly. Optional equipment shown includes drum closure, hydraulic chute lift, flush and measuring tanks, water nozzle, and revolution counter.

To obtain Bulletin 256 write to Westinghouse Transit Mixer Division, LeTourneau-Westinghouse Co., 217 S. Belmont Ave., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 4.

New power units are small and lightweight

■ The LearCal Division of Lear, Inc., has introduced a line of small, lightweight, auxiliary power units that



The LearCal Model 5903 Series weighs less than 35 pounds and can be carried easily to any job by one man.

can be hand-carried to any job where electric power is needed for lighting, electric motors, heaters, and tools. The Model 5903 series is a self-contained, gasoline-engine-driven generator package which supplies either 1,350 watts of DC power or 1,500 watts of 400-cycle AC power.

The unit weighs less than 35 pounds. It consumes approximately one quart of fuel per kilowatt-hour. The engine, which is air-cooled, has an automatic rewind starter and is equipped with a muffler. Other models have outputs of from 250 to 3,500 watts.

For further information write to Lear, Inc., LearCal Division, 3171 S. Bundy, Santa Monica, Calif., or use the Request Card at page 18. Circle No. 70.

New handbook details tilt-up construction

The fourth edition of the "Manual of Tilt-Up Construction", subtitled "Manual of Precast Concrete Construction", offers a detailed study of the tilt-up method of building construction. The text offers a brief history of building and a picture-story history of precast-concrete construction of various types of structures.

Such subjects as casting surfaces and molds, field layout, panel fabrication, erection, costs, and bond breaking are discussed.

Written and published by F. Thomas Collins, Consulting Engineer, the manual, priced at \$12.50, may be obtained from the author at P. O. Box 208, San Gabriel, Calif.

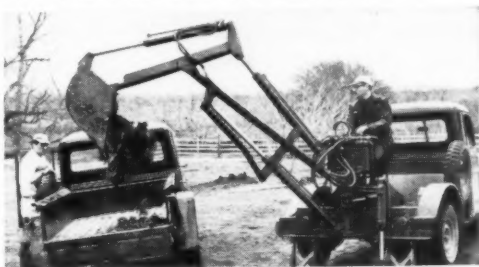


4-wheel drive traction. The rugged Universal 'Jeep'®, with the extra traction of its 4-wheel drive, is an all-purpose workhorse, whether providing transportation for initial surveys, taking men and tools to their assignments, or carrying supervisory personnel for inspection work. It carries 7 workers or up to half a ton of equipment and supplies, tows heavily loaded trailers on the road or off.

Why 'Jeep' versatility and all-wheel traction save time and manpower for contractors!



Transportation. The performance-proved 4-Wheel-Drive 'Jeep' Truck travels through deep fill or over rough terrain with men and equipment. It carries more than a ton of payload, on the road or off—climbs 60% grades, fully loaded.



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In their weight class, 'Jeep' vehicles are the *only* vehicles originally designed and engineered completely for 4-wheel drive, off-the-road use. That's why they're matchless for year 'round construction operations, in good weather or bad.

These versatile vehicles have proved their all-around mobility and wide range of performance on countless construction projects! Their rugged functional design stands up to the toughest use—and the extra traction of their time-tested and performance-proved 4-wheel drive takes them up steep grades—through mud, sand and soft earth—anywhere they have to go in or around the construction site. For highway travel they shift easily into conventional 2-wheel drive. And with power take-off they operate many types of equipment from winches to back hoes.

Multi-purpose 'Jeep' vehicles supplement heavy-duty equipment, spread their costs over a wide variety of jobs, give you additional savings through long life and low maintenance costs. Ask your Willys dealer for a practical, on-the-job demonstration.

The **Jeep**®

family of 4-Wheel-Drive vehicles
WILLYS...makers of time-tested utility vehicles

*Model CJ-5 shown

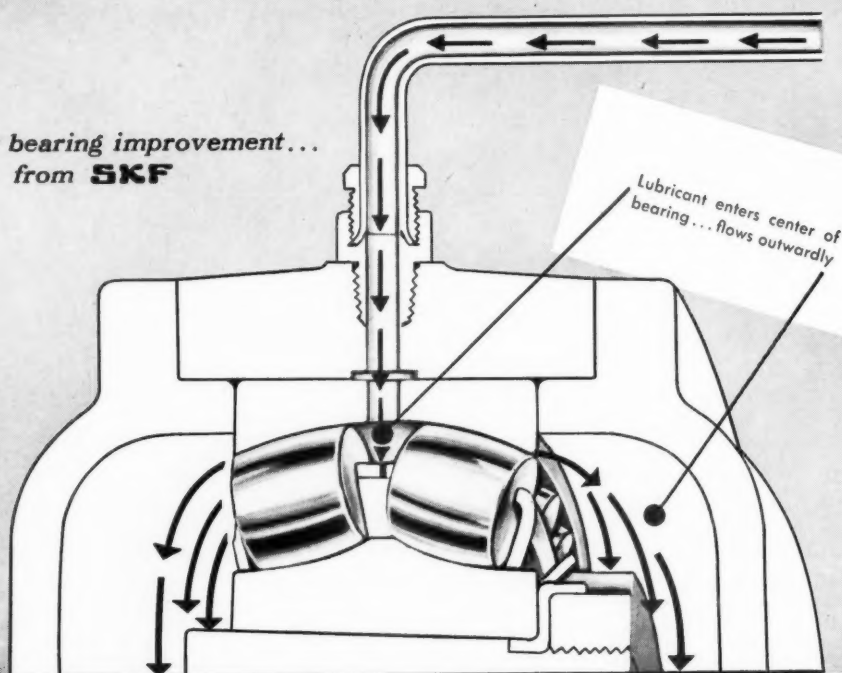
WILLYS MOTORS, INC., TOLEDO 1, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 412

Switch in road-relocation work keeps project on economical basis

On-the-spot changes in sequence of concrete paving operations result in smooth going after unforeseen problems arise

Another bearing improvement... from SKF



NOW AT NO EXTRA CHARGE— SKF's improved method of lubricating large spherical roller bearings

To make the lubricant effective it should be located where needed—in the bearing. Also, new lubricant, when added, should enter where it does the most good—in the bearing.

For these reasons, all future production of SKF double row spherical roller bearings above 240 mm O.D. (9.4488") will be made with three equally spaced drilled holes in the center of the outer ring without any extra charge to our customers. This permits the lubricant to enter the center of the bearing.

With the lubricant (either grease or oil) being introduced into the center of the bearing, all working surfaces are quickly and completely covered. In addition, the outward flow flushes out the old lubricant, and with it, any abrasive dust, dirt, moisture or other impurities.

And where circulating oil lubrication is required, there is a continuous flushing and cooling of the bearing.

This is another example of how SKF helps you to obtain longer bearing life.

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SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

—manufacturers of SKF and HESS-BRIGHT® bearings.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 413

Consult your SKF District Office today for complete information so that you can be the first to incorporate into your products this improved method of lubricating large spherical roller bearings.

When S. J. Groves & Sons Co., Woodbridge, N. J., began construction for an additional two lanes of concrete for 2.2 miles of U. S. 46 near Hackettstown, N. J., the firm planned to work the paving train from one end of the job to the other.

The original plan for this million-dollar project was to start grading operations and work on two concrete retaining walls simultaneously, so that both these phases of the work would be complete at approximately the same time. This would have allowed a fast, efficient, paving train to do an uninterrupted job. One of the retaining walls was to be 700 feet long, and the other, on the north edge of the roadway, 500 feet long. Both were to support a fill required in this section.

Following this plan, Groves began roadway excavation with six Euclid scrapers, which moved about 45,000 cubic yards of earth and rock to fill areas before the firm ran into trouble and had to completely revamp its job sequence.

Original plan

The original plan was to construct the walls and roadway on a sidehill cut along the north edge of the old road, and this required additional excavation before the rock could be reached. Two benches were to be cut along the existing slope so that both walls could be constructed simultaneously. The top bench was to go down to the rough grade of the proposed road, on which the south wall was to be built. The lower bench was to provide access for excavating equipment removing overburden for the north wall. Both benches were to be used as haul roads by ready-mix trucks delivering concrete for footings and walls.

Plan revised

The rock ledge that was to support the retaining wall footings was found, on excavation, to be about ten feet below the level shown on the plans. The need for additional excavation made it evident that the lower bench could not be cut and still provide ample working area for equipment and batch trucks.

Realizing that there would be a delay in constructing the walls,

CONTRACTORS AND ENGINEERS



When two wide benches could not be cut to construct retaining walls, both walls were built from one bench. This Rex truck mixer uses the bench as it chutes concrete to a 250-yard north-wall footing pier.

C&E Staff Photos



The north wall footing is poured in 30-foot alternate sections. The 700-foot-long south retaining wall, upper right, has been completed. Guardrails above are on the existing portion of U. S. 46.

Groves immediately revised his work sequence so that no time was lost and the job could proceed efficiently. First, a bench was cut to an elevation a little below the final roadway subgrade so that work could start on the south wall. Working from this bench, the contractor dug into the existing slope until the rock ledge was hit. Men originally scheduled to be working on the north wall were used on this work to speed the preparation of the retaining-wall footing.

Rock drilling for the footing was handled by pneumatic hand drills powered by an Ingersoll-Rand 600 air compressor. Holes 1½ inches in diameter were sunk to average depths of 2 to 3 feet, loaded very lightly with dynamite, and blasted. The contractor used 25 and 50 millisecond delays to secure proper fragmentation.

Concrete for the 700-foot wall was furnished by Sequine-Bogert Co., Inc., from its Netcong, N. J., plant, and delivered to the job in ten 5½ to 7-yard Rex truck mixers. Forms for the footing and walls were fabricated in place. Wall pours were made in alternate 30-foot sections, the truck mixers emptying their contents down chutes leading into the forms. Homelite gasoline-driven vibrators consolidated the concrete.

Roadway work continues

With work on the retaining walls well under way, the contractor turned his attention to the roadway grading. Groves set up two borrow pits to provide an additional 95,000 cubic yards of fill for the roadway. In one pit, a Northwest 80-D shovel loaded a fleet of twelve 4-yard dump trucks, while in the other pit at the opposite end of the project, five Caterpillar DW21 scrapers were push-loaded by an Allis-Chalmers HD-19 tractor. The shovel and fleet of trucks were later moved over to this pit once they had exhausted material at the first site.

By the time all the fill had been placed on the roadway, the south retaining wall was complete and work started on the north-wall excavation. Earth access ramps, cut down from the first bench at both ends of the proposed north-wall location, made it possible for Groves to bring in earth-moving equipment and cut another

(Continued on next page)

New RB&W Booklet gives the plain facts on bolting

...a big help for steel constructors

THIS NEW instructive booklet was prepared with ironworkers in mind. Quickly and to the point, it gives all the information a man needs in order to use high strength bolts to make a better steel joint . . . whether he's erecting a building or bridge, or repairing equipment.

It's timely information, too. More and more buildings are now being bolted instead of riveted. RB&W is proud to have pioneered in this development. Send for free copies of this booklet — and tell us how many you want for your men.



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LIGHTWEIGHT ONE-MAN OPERATION!

Smallest Vibrator Head Made!

1 1/4 inches in Diameter
with high frequency and high kick
**ABLE TO HANDLE STIFF MIX-
LOW SLUMP CONCRETE!**

Will do 90% of the contractor's
work better and — at lower cost!

900 J-5 WYCO Vibrator overall
length 6' — Vibrator 1 1/4" diameter
— Total weight 20 lbs.

Flexible shaft extension up to 15' long



\$135.00

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WYZENBEEK & STAFF, INC.

223 No. California Ave., Chicago 12, Ill.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 415

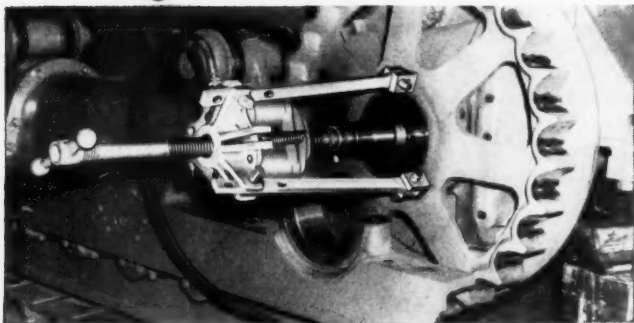
Here's how to CUT DOWN-TIME

with **OTC** hydraulic
power
units

Portable Pulling and

Installing Units Save Time on

Thousands of Jobs in Shop or Field

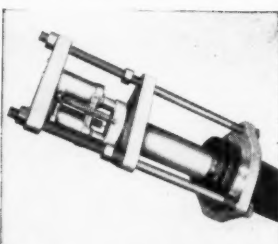


One of hundreds of jobs done easier and faster with OTC hydraulic pulling units. Here a 50 ton Power Twin unit is removing a crawler tractor sprocket.

OTC tools save time because they go to work fast—they fit the work and one man can set the pulling units in position in minutes. Then the powerful ram goes to work saving hours and sometimes days in repairing all types of field equipment.

OTC famous hydraulic tools offer up to 100 tons of power to instantly pull or install parts without distortion or breakage. For more than 20 years OTC tool designers have worked with factory service engineers building these tools to speed maintenance in shop or field. Sets are available for all makes of tractors and other equipment.

Whatever your special problem, let us help you. OTC manufactures the most complete line of pulling tools available. Start now to save time and money. Get acquainted with OTC.



OTC 50 ton unit—the only tool that can remove and install International TD 24 track and accumulator spring in the field.



OTC 100 ton Power Twin hydraulic unit removing pivot shaft from a TD 18 tractor.

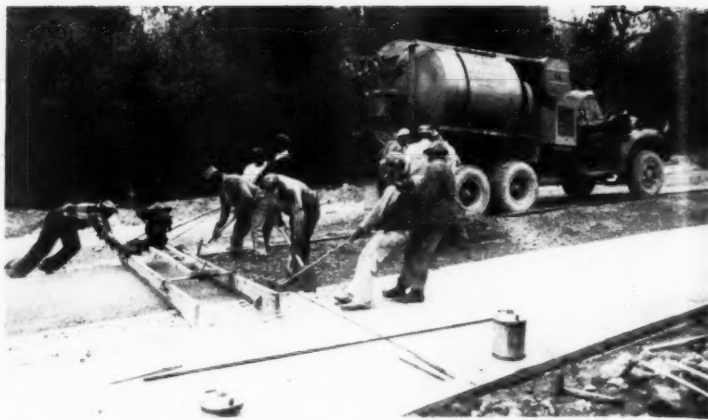
SEND FOR NEW FREE HYDRAULIC BOOKLET

OWATONNA TOOL COMPANY

381 CEDAR STREET

OWATONNA, MINNESOTA

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Since paving equipment could not ride on a slab less than three days old, a White-man rodding board, its action resembling that of a double-screed transverse finisher, is used to screed concrete. Concrete is chuted to the subgrade from a Rex truck mixer.

C&E Staff Photo

(Continued from preceding page)

bench just wide and long enough for the footing of the retaining wall. Once the overburden had been removed, the same drilling and blasting procedures used on the south wall were used to loosen the rock. The material was removed by a Northwest crane with a clamshell bucket, located on the upper bench, and loaded into trucks hauling to fill areas.

The 500-foot wall contains approximately 4,500 cubic yards of concrete

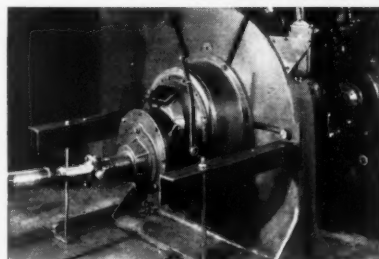
and has a section where the wall above the footing is 25 feet high. The largest footing, also in this wall, is 24 feet deep and supports a 14-foot wall. Concrete for walls and footings was placed in the fabricated forms by ready-mix trucks and chutes. Extra-long chutes were needed to span the distance from the wall forms to the upper bench, which was used as a haul road by the ready-mix trucks.

The walls are 1 1/2 feet wide on top and have an inside and outside batter. Inside wall surfaces are on a 3 on 12

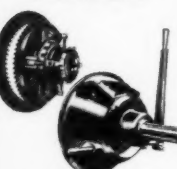
ROCKFORD

MEMO
Clutch must be
conservatively
rated—

ROCKFORD POWER TAKE-OFFS are designed for generous overload capacity within the fields of service recommended by Rockford Clutch engineers.



POWER



TAKE OFF

Large ROCKFORD clutches, power take-offs and speed reducers are tested for torque, engaging pressure, release, temperature, gear strength, bearing endurance and clutch facing wear on this 400

H. P. diesel powered, electric dynamometer. Let ROCKFORD engineers utilize this machine to improve your heavy-duty power transmission controls.

**ROCKFORD
Clutch Division
BORG-WARNER**

314 Catherine St., Rockford, Ill.

CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 417

CONTRACTORS AND ENGINEERS

batter while the outside faces have a 2 on 12 batter.

After the north wall had been completed, backfill material was placed to build up the roadway to designed subgrade elevation. Between the two retaining walls are two sidewalks 5 to 6 feet wide, a 10-foot macadam outside shoulder, a 5-foot macadam inside shoulder, and two 12-foot reinforced-concrete lanes, each 8 inches thick.

By the time the 500-foot wall was completed, paving operations were in high gear. The entire length of the roadway had been graded and compacted by sheepsfoot and Galion 10-ton three wheel and pneumatic rollers. And about 18,000 cubic yards of special subbase material, trucked in from a commercial quarry 8 miles away, had been spread and compacted by a Vibro-Plus roller.

Paving sequence

When the contractor saw that the delay in building the retaining walls would make it impossible to pave the road from one end to the other, he set up a paving schedule that would complete all of the two-lane roadway, except for the 2,500-foot stretch between the retaining walls. By the time work was completed on the north wall, only this short stretch remained to be paved.

Though this schedule made it nec-

essary to relocate the paving spread a number of times, the job of moving the train was simple. Equipment was placed on trucks, which used the existing portion of U. S. 46 to move the train from place to place.

About 4,000 linear feet of 8-inch keyed forms used on the job was held in the manually-prepared form trench by steel form stakes driven by a self-propelled Le Roi Tractair. About 500 feet of forms was always kept ahead of the paving spread.

Leading the paving train was a Blaw-Knox subgrader that rode on the forms as it cut the base to final elevation. A Galion 10-ton three-wheel roller followed to compact the base and smooth out the ridges left by the subgrader.

Concrete, again furnished by Sequine-Bogert in Rex truck mixers, was chuted in front of a Blaw-Knox spreader which leveled the material to a 6-inch depth. After wire-mesh reinforcing had been placed, additional concrete was spread to bring the total slab thickness up to 8 inches. Mall vibrators consolidated the concrete as it was placed.

A Jaeger double-screed transverse finisher and Koehring longitudinal floating machine followed the spreader, and final touches were given to the concrete with hand lutes and

(Concluded on next page)

Increase the Productivity of Your Tractor

30 to 50% with a

WHITESTOWN TRENCHER

For Tractors Equipped with Hydraulically Controlled Tractor Shovels
Now available for new Caterpillar Tractors Model Nos. 933 and 955



- Digs 8 feet deep, and dumps up to 12 feet high
- Ideal for foundation excavation
- Especially built for trench work for wall footings, sewer and electric conduit trenches
- Efficiently loads dirt into trucks
- Can be used as a crane for material handling or unloading
- Available with blade for bulldozing or backfilling
- Digs curb ditches close to bank with offset brochet
- Especially useful where working space is limited

WHITESTOWN TRENCHER CO., INC.
WHITESBORO, NEW YORK

For more facts, use Reader-Reply Card opposite page 18 and circle No. 419



POSEY LARGE O. D. PIPE

(36" DIAMETER - 1/2" WALL)

**SPECIFIED FOR SEWAGE OUTFALL
LINES IN KEARNY, NEW JERSEY
SEWAGE DISPOSAL PLANT**

Whatever your requirements... carbon steel, stainless steel, nickel clad, stainless clad, monel clad or wrought iron... Posey has facilities for fabricating pipe and piling from 20" diameter and larger.

Let Posey quote on your next pipe job. Posey has a reputation for meeting delivery and budget requirements. Write for specifications and prices.

POSEY IRON WORKS, INC.

STEEL PLATE DIVISION

LANCASTER, PA.

New York Office: Graybar Building



For more facts, use Reader-Reply Card opposite page 18 and circle No. 420

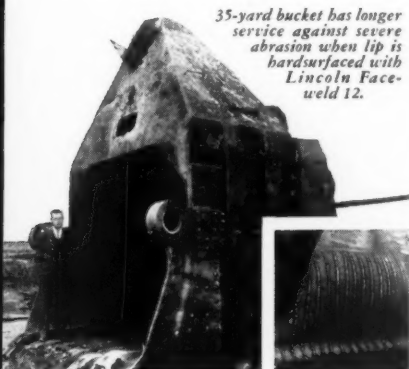
When only
2 electrodes...

Handle most
hardsurfacing
needs...

Yet give you
longer life
against impact
and abrasion...

WHY

buy anything
but **LINCOLN**
Abrasoweld
and Faceweld
hardsurfacing
electrodes



35-yard bucket has longer service against severe abrasion when lip is hardsurfaced with Lincoln Faceweld 12.

HOW TO CUT LIP WEAR ON BUCKETS

PARALLEL beads of Lincoln Faceweld 12, placed 2 1/2" apart result in equivalent wear life to that of a fully coated surface, according to operators.

On this 35 cubic yard bucket there are 16 rows of Faceweld beads extending across the bottom of the lip and a third of the way up the sides as shown in the inset. The spans between the beads are believed to fill up with excavated material resulting in the longer wear.

Lincoln Faceweld and Abrasoweld can solve many of your hardsurfacing problems with similar success. Write us for details.

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

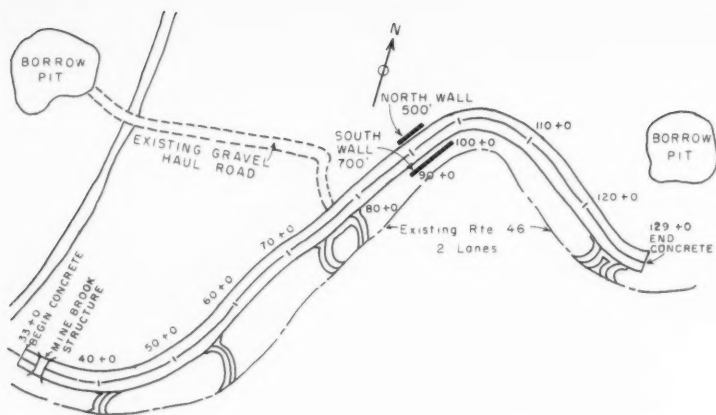
*The World's Largest Manufacturer
of Arc Welding Equipment*

THE LINCOLN ELECTRIC COMPANY
Dept. 5309, Cleveland 17, Ohio

Send me Bulletin SB-1352 on Lincoln
Hardsurfacing Electrodes.

Name _____
Position _____
Company _____
Address _____
City _____ State _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 418



Paving sequence:

1. Ramps at 125 + 0 and 127 + 0
2. South lane, from 105 + 0 to 129 + 0
3. West half of ramp at 55 + 0
4. a. South lane, from 33 + 0 to 80 + 0
- b. Ramps at 75 + 0 and 78 + 0
5. North lane, from 105 + 0 to 129 + 0
6. North lane, from 33 + 0 to 80 + 0
7. Fill in miscellaneous ramps
8. Close area between 80 + 0 and 105 + 0

(Continued from preceding page)

a burlap drag. Thompson curing compound was sprayed over the surface after the concrete had attained initial set. This allowed the forms to be stripped by hand after 24 hours and loaded onto trucks to be taken to another part of the job.

Double reinforcing was required on a 1,200-foot section at the eastern end of the project, where poor foundation existed. Heavy rains had made this condition worse just before paving started. The wire-mesh reinforcing, placed 2 and 6 inches below the surface of the slab, gave the concrete more rigidity so that cracking is less likely to take place.

The best paving production on a 12-foot-wide lane for a single day came to 1,254 feet. This was good, considering that paving had to be done on an upgrade of about six per cent.

Concrete placed by hand

Some lanes were put down adjacent to lanes with concrete not more than three days old, and since the paving spread could not ride on the new slab, Groves used a Whiteman gasoline-driven rodding board to spread concrete by hand for a roadway lane or entrance-exit ramps. This equipment was used to good advantage where the radii of ramps made it impossible to use the paving train.

In this work, concrete was dumped between a freshly poured slab and forms, struck off at 6 inches to permit wire mesh to be placed, and additional concrete placed over this reinforcing. The concrete was then spread to an 8-inch depth by the rodding board. The strike-off board and the rodding board were pulled by workmen, the rodding board working much like a double-screed transverse finisher. This concrete was consolidated and finished with the same method used on the rest of the project.

The new two-lane roadway, now the westbound lane of U. S. 46, is on a 6 per cent downgrade for most of its distance. The old two-lane stretch is the eastbound roadway and is upgrade in this area. Both roads are linked by concrete ramps with two 12-foot or 10-foot lanes.

Before the new stretch was opened, this short section of U. S. 46, with grades of more than six per cent and a snake-like alignment, was treacherous for two-way traffic. The new road, though it is on a six per cent downgrade, has a straighter alignment than the old road.

Personnel

J. F. Vallone was the project manager and O. Teijeiro, superintendent, for S. J. Groves & Sons. Project engineer for the contractor was W. J. Rafetto. E. Benoist is resident engineer for the New Jersey State Highway Department.

THE END

Parkway-Thruway link

Katharine E. White, chairman of the New Jersey Highway Authority, last month turned the first shovel of earth to start work on the 9½-mile link between the Garden State Parkway and the New York State Thruway.

UNIVERSAL FORM TIES *a Complete Line From 1 Source*

SPIROLOC Form Ties

Faster Erection . . . Positive Holding . . . Easier Stripping



Available with nut washer

SPIROLOC Cone Nut Assembly



The most positive internal spreader and form tie

- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. **LOWER MATERIAL and LABOR COSTS**
- Positive breakbacks
- Permanent, reuseable equipment
- **RENTED . . . SOLD**

TWISTYES

Positive Spreader Ties for all types of Concrete Construction



SNAP TIES



Combination wedge and bearing plate . . . easy application . . . won't twist or fall off — ample take-up.



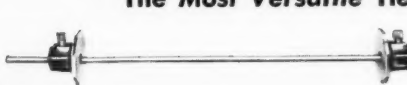
- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor



Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The Most Versatile Tie . . . At the Lowest Cost



- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

"Sure-Grip" principle means positive locking **SAFE . . . SURE** Tying

UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

OFFICES AND WAREHOUSES:
CLEVELAND, OHIO, 24901 Lakeland Blvd. • BALTIMORE, MD., 1020 N. Kresson St.
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LOS ANGELES, CALIF., 5855 South Western Ave. • ATLANTA, GA., 1401 Howell Mill Rd.
DISTRIBUTORS IN PRINCIPAL CITIES

Service
Wherever
You Build . . . Coast to Coast



New vibrator reaches hard-to-get-at areas

Wyzenbeek and Staff, Inc., announces the development of a new lightweight one-man-operated concrete vibrator.



This new Wyco concrete vibrator is designed to reach ordinarily inaccessible places.

Companion to the standard line of Wyco vibrators, this Junior vibrator is especially designed to vibrate concrete in portions of the form not accessible to ordinary vibrators. The 1 1/4-inch-diameter head is said to vibrate around reinforcing rods and spreaders and in recesses of the forms which other vibrators cannot reach.

According to the manufacturer, the new unit has great adaptability for vibrating such areas as concrete columns, window sills for industrial buildings, curbing, chimney caps, concrete steps, and stoops. The high "kick" of the Wyco Junior vibrator reportedly makes possible the use of lower-slump concrete, resulting in greater structural strength.

For further information write to Wyzenbeek & Staff, Inc., 223 N. California Ave., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 65.

Lubrication units

The truck-mounted Arolube lubrication rig is described in a brochure from the manufacturer, The Aro Equipment Corp. A schematic drawing and a picture of the entire unit show its various parts. Also included in the catalog are details on 400-pound pumps, open hose reels, and Arolube accessories. Pictures and specifications are included for each item.

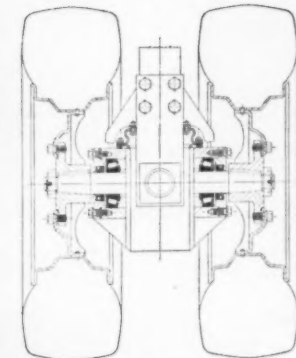
To obtain Form 5602-L2 write to The Aro Equipment Corp., 1949 Erie Ave., Bryan, Ohio, or use the Request Card at page 18. Circle No. 39.

Line of trailers

Low-bed, tilting, and dump trailers are among 15 models pictured and described briefly in a folder from Transport Trailers, Inc. Low-bed models are shown in capacities to 75 tons; tilting models in capacities to 22 tons. Pertinent specifications are included.

To obtain Form 156 write to Transport Trailers, Inc., P. O. Box 968, Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 140.

A PIECE OF CONCRETE WALL which has been cut with a specially-fitted powder-cutting blowpipe is lifted out of place by a Unit truck-crane during a demolition job at Tonawanda, N. Y. A Linde powder nozzle enabled the contractor to make clean, straight cuts through this 10 to 18-inch-thick reinforced concrete wall. The Linde powder nozzle is said to permit easy, quick cutting of cement, concrete, and reinforced concrete, with cutting speed depending on the thickness of the concrete. For further information write to Linde Air Products Co., Division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y., or use the Request Card at page 18. Circle No. 57.



How WM. BROS BOILER & MFG. CO., Minneapolis, Minn., mounts Timken tapered roller bearings on the roller wheels of its new pneumatic tired roller to take the load, reduce friction.

How TIMKEN® bearings give roller free and easy ride, keep it rolling

HOW to assure free turning of wheels and shafts under a 9-ton load was one of the problems when this new Bros self-propelled roller was designed. Engineers came up with the answer by using Timken® tapered roller bearings on front wheels and rear drive axles. With heavy loads absorbed and friction virtually eliminated by Timken bearings, wheels and shafts turn freely and easily. The roller works steadily day-in-and-day-out.

Because of their tapered construction, Timken bearings take both radial and thrust loads in any combination. Full line contact between

Timken bearing rollers and races provides extra load-carrying capacity.

What's more, Timken bearings practically eliminate friction because they are designed by geometrical law to have true rolling motion; and manufactured with microscopic accuracy to conform to their design.

Bearing closures are more effective because Timken bearings hold housings and shafts concentric. Dust and dirt can't get in—lubricant can't get out. Maintenance is minimized.

And with Timken bearings in the hydraulic steering assembly, steering is easier. Light pressure on the steer-

ing wheel is all that's needed to guide the roller.

No other bearing gives you all the advantages that Timken bearings give you. We even make our own fine alloy steel—America's only bearing manufacturer that does. Whether you buy or build machinery, make sure the bearings carry the trade-mark "Timken". It tells you the bearings are No. 1 for value. The Timken Roller Bearing Company, Canton 6 Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.

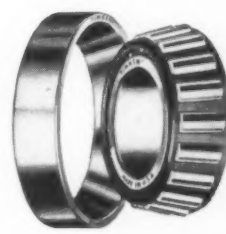


WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 422

Bulk cement containers unload by air pressure

■ Air-activated containers for transporting free-flowing granular materials, such as cement and fly ash, use an air compressor as the only piece of unloading equipment and are loaded by a shipper's standard bulk-loading equipment. The steel cylindrical shells are manufactured by the L. C. L. Corp. and are available in 10 or 11-ton-capacity sizes.

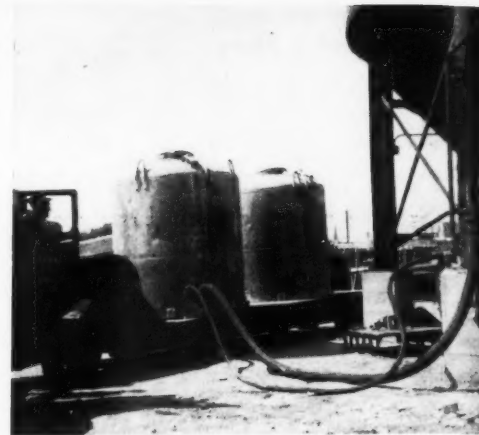
Materials are loaded through an inlet gate in the dished head of the container. Unloading is accomplished through a 4-inch-diameter flexible transport pipe: a compressor producing approximately 315 cfm at 100 psi injects air into the container through a 1½-inch air line, and the container's contents are extruded

through the discharge pipe to a storage bin or other receptacle.

The containers can be shipped by rail, water, or highway. Modified gondola cars carry five or six containers, depending on the model. When used in rail transportation, the manufacturer states, the containers and the gondola car constitute one piece of equipment for rate purposes; freight is charged at bulk rate only on the weight of the material transported.

Since the materials are never exposed to the outside, all-weather operation is possible. As many materials or grades of materials as there are containers can be included in one shipment because each is an inde-

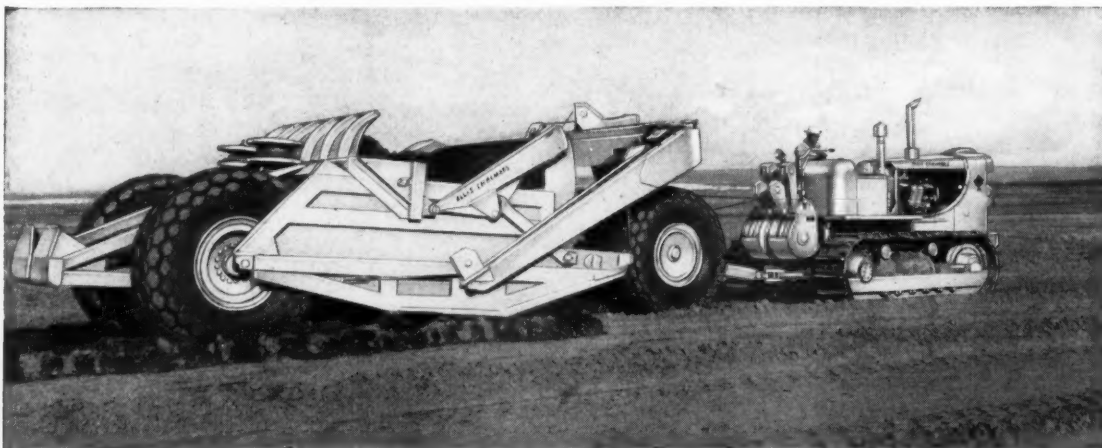
L. C. L. air-activated cement containers are unloaded into a bin at a job-site concrete plant.



pendent unit. With slight modifications, the containers can be used for the transportation of liquids.

For further information write to

The L. C. L. Corp., 230 Park Ave., New York 17, N. Y., or use the Request Card that is bound in at page 18. Circle No. 109.



Allis-Chalmers HD-16 crawler tractor and 315 pull scraper Teamed to increase output ...keep jobs on the move

Here's more of everything you want in a tractor-scraper team... a combination of advanced basic design features that cut cost and time per yard.

The HD-16 has an all-steel box-A main frame that absorbs shocks and protects the power train. A powerful Allis-Chalmers diesel engine and your choice of either torque converter or standard transmission drive, give you plenty of work power for big jobs. And with 1,000-hour lubrication intervals for truck wheels, idlers and support rollers, even under severe conditions, you can eliminate daily greasing... convert maintenance time into production time.

With its wide, low bowl and offset cutting edge, the 315 scraper makes effective use of the HD-16's power to get heaping, void-free loads. Wheels are inside the cutting edge for smooth loading... and loaded weight is equally distributed on all four wheels for fast hauling, long tire life.

This earth-moving team can give you big output plus real dependability. Let your Allis-Chalmers construction machinery dealer show it to you now.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIV., MILWAUKEE 1, WIS.

ALLIS-CHALMERS

HD-16

with hydraulic torque converter drive	with standard transmission
150 net engine hp	141 belt hp
31,600 lb	31,500 lb

AC-315

15 cu yd struck
20 cu yd heaped
25,850 lb
cable-controlled



For more facts, use Reader-Reply Card opposite page 18 and circle No. 423

Panel saw simplifies cutting of plywood

■ A panel saw said to simplify the cutting of large panels of plywood, masonite, plastics, and other materials into smaller sections has been introduced by The Richard C. Bennett Mfg. Co.

The machine, which is reported to eliminate waste of time and man-



The Bennett 2-Way panel saw is designed for easy one-man cutting of panels of plywood and similar materials.

power and at the same time produce cleaner and more accurate cuts, is known as the Bennett 2-Way panel saw. It measures 12 feet long, 6 feet 7 inches high, and 2 feet wide and weighs 140 pounds.

High-grade seasoned lumber serves as a sturdy frame for the tubular steel tracks between which the saw runs. The saw itself is mounted on a turntable that permits either ripping or crosscutting.

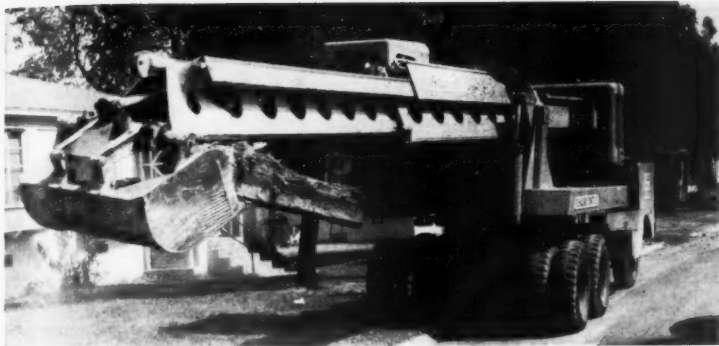
For further information write to The Richard C. Bennett Mfg. Co., Laceyville, Pa., or use the Request Card at page 18. Circle No. 112.

Controlled curing

■ Controlled concrete curing, a scientific method of keeping water in the concrete mixture in order that the concrete will develop its full strength, is described in a folder. According to the literature, the curing compounds—white pigmented, clear, and separation—will not run, cake in the drum, or leave bare or uncovered areas. The compounds change from liquid form to a gel when applied as a film.

To obtain this folder write to Serviced Products Corp., 6051 W. 65th St., Chicago 38, Ill., or use the Request Card at page 18. Circle No. 134.

CONTRACTORS AND ENGINEERS



Case history

Output more than doubled on asphalt removal job

Using a multipurpose Gradall to remove 120,000 linear feet of asphalt sidewalk and curbing proved between two and three times faster than other methods on a job in San Diego, Calif., handled by the R. E. Hazard Contracting Co.

Two different methods were tried on the project and neither could produce more than 800 to 1,000 feet per day. Then Wayne W. Wallace, job superintendent, put the company's Gradall on the job. The rig first removed and loaded 4 to 5-foot sections of sidewalk. Then it dug behind the curb and loaded out the curb sections intact.

The result was completion of 2,400 feet per day on the job. The Hazard firm reports that it has averaged over 200 on-the-job hours each month with its Gradall on a wide variety of construction projects.

For more information on the Gradall write to the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 181.

Ordinary paint useable on aluminum shelter

■ A shelter that is fabricated of aluminum and can be painted with ordinary paint is available from the Leighton Products Corp. An Aluma-Shed can be assembled in one hour using a screw driver and a pair of pliers, the manufacturer states.

The assembly is available in two types. The shed type can be erected anywhere and the lean-to is attached to the side of a building. Each is 80 inches high, with floor-dimension sizes of 50×50 inches or 72×50 inches. Included is an 18×24-inch window. The walls and roof are made of paintable aluminum, corner supports are of galvanized angle iron, and assembly is made with zinc or cadmium-plated bolts and nuts. Rubber or neoprene washers are used to cover all holes.

The manufacturer recommends the Aluma-Shed as a tool house, pump house, field construction office, and for various types of storage, including the storage of combustibles. The structure can be bolted or pegged to a concrete foundation, earth, or any solid base. Provision is made for drop-in wooden floorboards.

For further information write to the Leighton Products Corp., 75 Leighton Ave., Rochester 9, N. Y., or use the Request Card at page 18. Circle No. 85.

New electrode for use where fit-up is poor

■ Operating on either ac or dc current, the Hobart 212 electrode is reported to produce very little spatter even when using amperages higher than normally used for this type electrode.

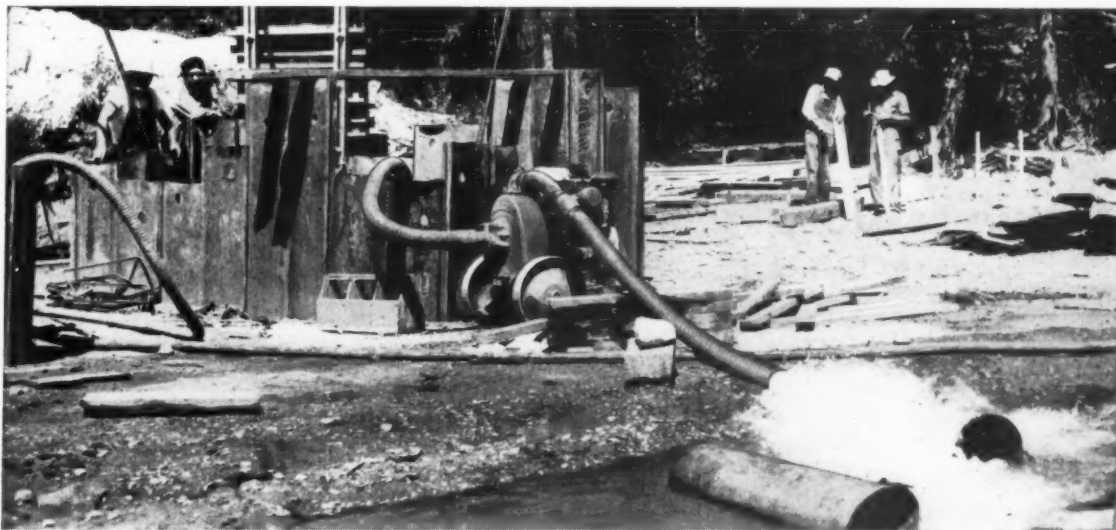
Designed for fast production and fabrication welding, the electrode can also be used for maintenance welding. It is recommended for use where fit-up is poor. The weld deposit is uniform, smooth, and convex in shape, according to the manufacturer.

The Hobart 212 comes in six diameters ranging from 1/8 to 5/16 inch. All but the 3/32-inch size are packed in 50-pound bundles. The 3/32-inch size comes in 25-pound packages.

For further information write to the Hobart Bros. Co., Hobart Square, Troy, Ohio, or use the Request Card that is bound in at page 18. Circle No. 107.

Motorola reorganizes national sales structure

Four new geographical sales divisions have been established by Motorola Communications & Electronics, Inc., Chicago, Ill., as part of the major expansion of the firm's national sales structure. As a result of the expansion, Arthur L. Reese, former assistant secretary, was appointed vice president and operations manager, and Eugene S. Goebel, former national sales manager, was named vice president for market relations.



PUMPING HEAVY INFLOW FROM PIER COFFERDAM was handled by this Jaeger 3" Sure Prime pump, of 20,000 gph capacity.



INSIDE DEWATERED COFFERDAM, workmen place reinforcing steel for pier foundation. Job is one of 4 reinforced

concrete bridges on State Route 26 between Arkadelphia and Antoine, Arkansas. W. C. Burrow, contractor.

When you're in a hole, you want a Jaeger pump

We've yet to meet an experienced contractor who wouldn't bet his shirt on a Jaeger "Sure Prime" pump when the chips were down.

Disregarding "claims", he knows that only a Jaeger has two independent, simultaneous priming actions to give him fast, doubly sure priming when he needs it—that a Jaeger primes and pumps at easier, engine-saving speeds (actually 300 to 600 rpm slower than some pumps

claiming equal capacity)—that it is the only pump in which the shaft seal is positively lubricated and provided with a ready-inspection port.

For any capacity up to 240,000 gph, or pressure up to 275 psi, there's a Jaeger pump you can depend on to do your job. Check with your Jaeger distributor—or send for Catalog P4.



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Greater N. Y. Council has annual safety convention

**Construction session hears engineers;
sees reenactment of safety meeting**

The best way to do a job will turn out to be the safest way, John P. French, construction safety engineer of the Lumbermen's Mutual Casualty Co., told the construction session of the Greater New York Safety Council's 26th annual convention and exposition. The five-day convention was held at the Hotel Statler in New York City.

"If a method is not found to be the safest way, then it is not the best way and should be analyzed again," Mr. French said, "for . . . method engineering is safety engineering."

Mr. French was one of the speakers on a construction session program that included a reenactment of a laborers' safety meeting as conducted at the construction firm of Hendrickson Bros., Inc., Valley Stream, N. Y., and a talk concerning safety training and safety engineers delivered by Thomas M. Lively, consulting safety engineer of Minneapolis, Minn.

Hazards constitute inefficiency

"Generally, by giving thought to eliminating the hazards in an operation, we discover that the hazards, themselves, constitute a major part of the inefficiency of the operation," Mr. French told his audience. He referred to the use of tubular staging for supporting deck forms, and steel strapping for securing column and footing forms, as two methods which eliminate safety hazards and, at the same time, bring about a more economical, efficient operation.

The tubular staging does away with the maze of lumber supports that must be cut to size, erected and dismantled piece by piece, and generally cannot be used for another deck without being recut. Use of the tubular staging also frees much of the deck below for other work and eliminates the hazard of patchwork of lumber supports.

Steel strapping simplifies column and footing forming by eliminating the need for studs and wales and other complicated bracing. The form walls can be fabricated on the ground, lifted into place by a crane, and secured with the strapping. The forms are stripped by cutting the rings of strapping and they can be used over and over again.

Mr. French explained how the use of two new devices—one for moving large quantities of brick from the stockpile to the brick layers and the other for moving palletized materials from the ground to the deck where

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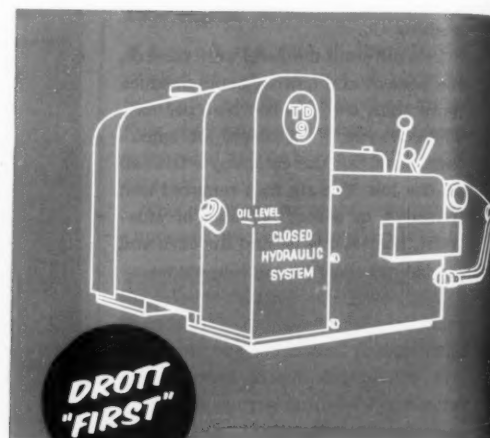
it is needed—cuts down the material-handling steps. (See "Units simplify handling . . ." on page 150.)

"Reducing the number of material-handling steps makes for efficiency and affords less opportunity for accident," he said.

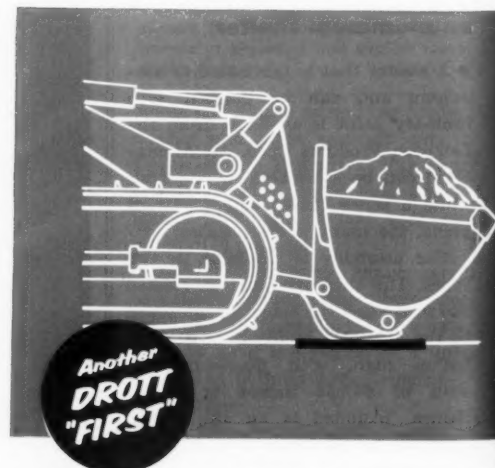
Mr. French pointed out that safety was necessary to operate competitively. Materials cost one contractor just about as much as another; there is little competition on that score. But a minimum of lost-time accidents means increased productivity, and that is a variable a contractor can control.

Haven't convinced contractors

"The problem seems to be," declared Mr. French, "that we have not yet found the one approach to the



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accident-prevention problem which will convince contractors that safety is necessary to operate competitively. Accident frequency can well be a line parallel to job efficiency if the two were to be graphed together on a progress chart.

"I have yet to see any construction operation, seriously scrutinized from an accident-prevention standpoint, which did not produce some improvement either in the operation or in the efficiency of the operation.

"I sincerely believe that if we convince the job superintendents and foremen of their responsibility for job safety, we will, at the same time, get them to think of better and more efficient operations. This does not mean revolutionary changes in the industry or earth-shaking discoveries,

but concerns itself with those familiar job operations which always seem to consume some time and always account for a good percentage of construction accidents."

Noting that some contractors maintain that construction work is entirely different from work in other industries, and that their own experience on specific jobs is the best criterion for work methods, Mr. French said:

"No matter what your opinion is on safety engineers, remember this: Your best and most experienced superintendent will probably work on no more than fifty large projects . . . in his lifetime. I manage to visit approximately 1,000 projects a year. Something worthwhile should rub off from those many exposures to construction operations."

Laborers' safety meeting

Dr. Walter A. Cutter, assistant director of the New York University Center for Safety Education, conducted the reenactment of the Hendrickson safety meeting. His program was preceded by a short demonstration of what happens to the human anatomy when heavy objects are lifted incorrectly.

Four "don'ts" for employees to remember in order to do their jobs safely were enumerated by Dr. Cutter:

1. Don't depend on the equipment operator to keep you safe. The operator may not be able to see you or anticipate what you will do.

2. Don't overestimate the capacity of the equipment with which you work, even though you think you know it well. Familiarity breeds con-

tempt; don't become contemptuous of your equipment.

3. Don't be a clown or a showoff. They belong on television where the pay is much better.

4. Don't leave safety up to the other person. Feel responsibility for your own safety, the safety of your fellow workmen, and the safety of the general public.

Mr. Lively's talk

In his discussion of safety training and safety engineers, Mr. Lively divided accidents caused by unsafe acts into three categories: Lack of knowledge, lack of proper attitude, and physical or mental handicaps.

These can be overcome by training, discipline, and management, and the proper personnel placement—fitting the right man to the right job.

"Training," he pointed out, "doesn't just mean classroom lectures in a room filled with blackboards. A personal chat, between an employee and a superintendent or foreman, is also training that pays off. Round-table discussions are effective. I use the conference method and I find I do a minimum of the talking."

A great deal of the fault is often with the safety engineer, Mr. Lively said. Unsafe acts account for 85 per cent of the accidents, while the rest stem from unsafe conditions. The reports of safety engineers, however, too often are confined to recommendations for the elimination of unsafe conditions.

Putting safety across

Mr. Lively advised that there were certain principles to remember when trying to get the idea of safety across. "Don't talk to the men," he warned, "talk with them. Get their ideas. You'll be surprised how much they know and how much can be drawn out of them."

Also very important is the need to establish a want for safety. "You can't sell them anything they don't want," Mr. Lively said.

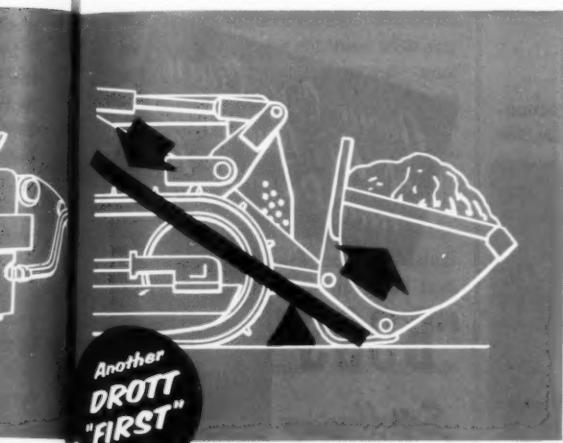
Robert L. Moore, director of the Technical & Engineering Division of the Lumbermen's Mutual Casualty Co., was chairman of the construction session. While closing the meeting, he inquired how many in the audience were contractors or were representing contractors.

Not more than six hands were raised. THE END

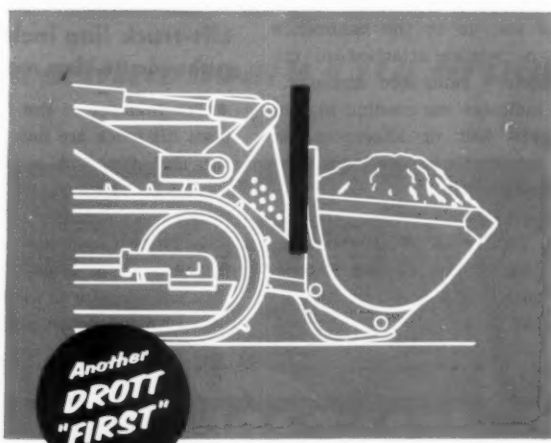
Soil-testing equipment

Physical soil-testing equipment for mobile field laboratories is described in a catalog from the manufacturer, Tinus Olsen Testing Machine Co. Various models for consolidation and shear testing are shown, including the Conbel, triaxial testing machines, an unconfined compression machine, and the direct shear machine. Consolidometers, load rings, and ejectors are also pictured. Descriptions and specifications accompany each model.

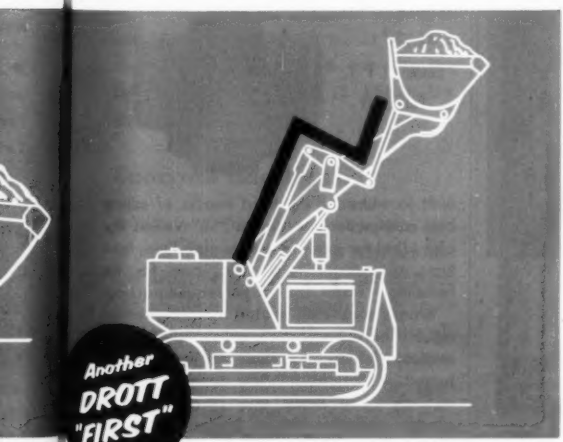
To obtain Bulletin 50 write to Tinus Olsen Testing Machine Co., 1188 Easton Road, Willow Grove, Pa., or use the Request Card at page 18. Circle No. 12.



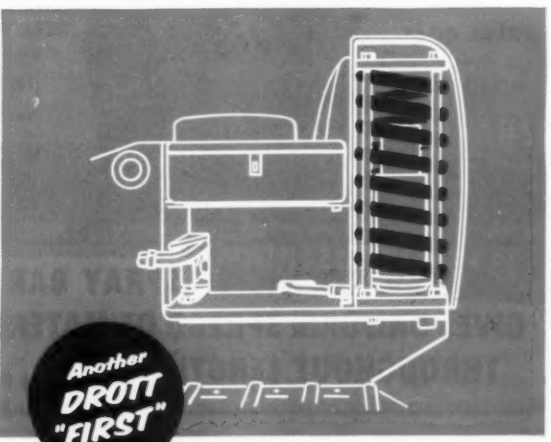
SINCE 1944 . . . Pry-action break-out
employs simple lever principle to give you exclusive triple-power digging force, ranging from 12,800 to 55,000 pounds! Shunts stresses into ground, so they can't maul bucket or tractor.



SINCE 1944 . . . Ground-level bucket roll-back Obtains heaped loads; keeps the heap to deliver extra yardage.



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Keeps bucket at its 42° non-spill, roll-back level, all the way up. Increases yardage—avoids spill-back.



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Soiltest's new pocket penetrometer tests the shearing strength of soils in the field. ▶

New pocket penetrometer classifies soil types

■ A new pocket penetrometer for field and laboratory classification of cohesive types of soil has been introduced by Soiltest, Inc. Using the penetrometer, engineers, contractors, testing laboratories, and construction inspectors can obtain a uniformity in soils classification and evaluation.

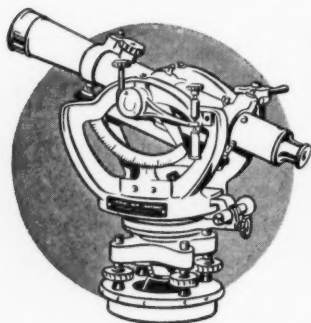
The new direct-reading penetrometer, which weighs 4 ounces and measures $\frac{3}{4} \times 7\frac{1}{2}$ inches, is an instrument for evaluating the shearing strength of soil in field exploration or on construction sites, and in preliminary soil laboratory studies. According to the manufacturer, it was developed on the basis of correlation studies which indicated that a very close relationship exists between the penetrometer readings and the soil type.

The penetrometer piston is pushed into the soil up to the calibration groove. A pointer attached to the penetrometer's calibrated spring assembly indicates the reading in tons per square foot or kilograms per square centimeter unconfined compressive strength.

For further information write to Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill., or use the Request Card that is bound in at page 18. Circle No. 115.



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manufacturer. This visibility permits faster load placement, reduced operator fatigue, and greater safety.

The QN-20 is powered by a heavy-duty, air-cooled Wisconsin gasoline engine. The Monomast feature is also available on Hyster's 3,000 and 4,000-pound models.

For further information write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore., or use the Request Card at page 18. Circle No. 77.

The single mast on the Hyster QN-20 enables the operator to see the forks easily and at all times.

Lift-truck line includes pneumatic-tire model

■ The features of the Hyster Monomast lift truck are now available, for the first time, on a pneumatic-tire truck, the Hyster QN-20. The new model has a capacity of 2,000 pounds on a 24-inch load center.

The single mast on the QN-20 permits the operator to see the forks easily and at all times, according to the

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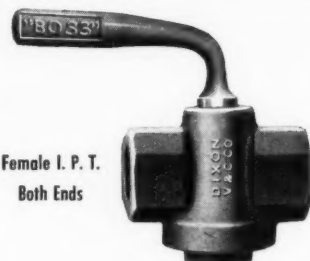


Standard Steel Works, Inc., NORTH KANSAS CITY, MO.

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"BOSS" Self-Honing AIR VALVES



Female I. P. T.
Both Ends

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTERNALLY ATTACHED HANDLE—In sizes $\frac{3}{4}$ " to $1\frac{1}{2}$ " valve stem and handle are combined in a strong one-piece forged steel unit which is anchored to the bronze plug within the valve body. This patented feature eliminates stem and handle breakage. Sizes $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " and 2" have externally riveted handles.



Male I. P. T. Both Ends

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CONTRACTORS AND ENGINEERS



The high reflectivity of Alumadek saves fuel in winter and makes interiors up to 15 degrees cooler in summer.

Aluminum deck assembled with patented lock clips

■ Reported to have a light reflectivity higher than can be obtained with any paint, Alumadek structural roof panels need no painting and eliminate a great deal of periodic maintenance costs. They are manufactured by the Metal Decking Corp.

The aluminum panels come in 12-foot lengths and are 25½ inches wide. The sub-purlins are made of zinc-plated steel in lengths up to 30 feet. The exclusive method of assembly, utilizing patented Speed-Lok clips, is said to be the fastest, most accurate in use.

According to the manufacturer, Alumadek has shown a 79 per cent light reflectivity in laboratory tests. In summer, the low emissivity of the aluminum reduces plant temperature as much as 15 degrees. Also, the reflective characteristic conserves radiant heat and thus effects fuel savings.

For further information write to the Metal Decking Corp., 11 E. 16th St., Indianapolis 2, Ind., or use the Request Card at page 18. Circle No. 86.

Concrete additives

■ Sika compounds for concrete and mortar and for protection and sealing are briefly described in a folder from the company. Listed under the topic of concrete are Plastiment, a retarding densifier; Sikacrete, an accelerating densifier that can also be used with mortar; and AER, an air-entraining resin. Under mortar are listed Kemox, a metallic compound; a water-resistant cement coat; and a shrinkage-reducing accelerator for terrazzo and marble work. Data is given on seal coating and joint sealers.

To obtain this folder write to Sika Chemical Corp., 33-49 Gregory Ave., Passaic 7, N. J., or use the Request Card at page 18. Circle No. 8.

Harnischfeger appoints

The Harnischfeger Corp., Milwaukee, Wis., has appointed Charles F. Parthum manager of advertising and sales promotion. Formerly with the Buchen Co., Chicago, Ill., Parthum is a graduate of the Universities of Michigan and Rochester.

This 10-ton Model 1000 Wisconsin equipment trailer is recommended for hauling crawler tractors and other slow-moving equipment.

New trailers feature fast, one-man loading

■ A new series of tilting-type equipment-hauling trailers, in capacities ranging from 2 to 12 tons, has been introduced by the Wisconsin Trailer Co. The new models include tandem, low-bed, and over-the-wheel units.

Features of the Wisconsin rigs include straight-through axles, 14½-inch-deep frames, adjustable pintle hooks, all-wood decks with no metal plates or wheel openings, and balancing that enables one man to lift



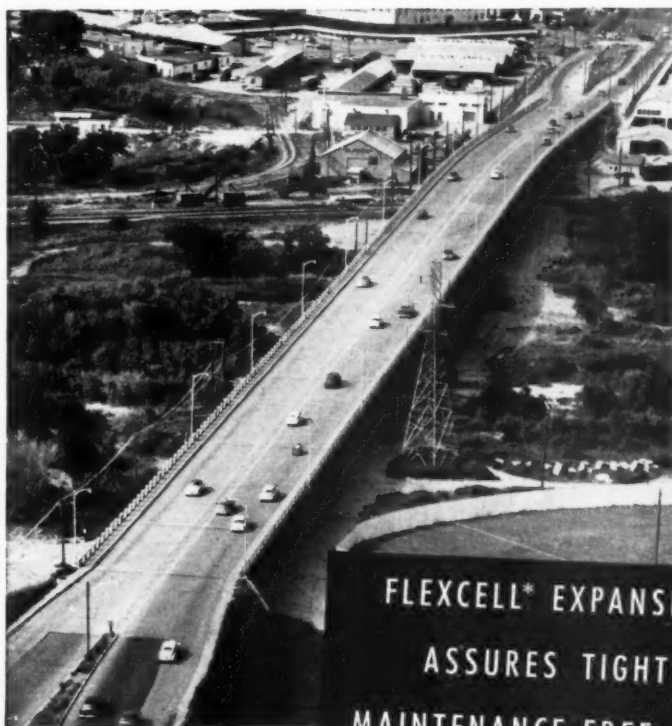
the tongue of the trailer and hook it to the truck.

All models feature a swing-type fixture to assure proper alignment. An 8-foot-wide deck and low climb angle make it possible for one man to load or unload a piece of rolling

equipment in less than a minute, according to the manufacturer.

For further information write to the Wisconsin Trailer Co., 1949 N. 121 St., Milwaukee 13, Wis., or use the Request Card at page 18. Circle No. 150.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 429

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Tunnel work . . .

(Continued from last month)

Steel and concrete lining

This is the fifteenth in a series of articles consisting of excerpts from the 1,280-page book, "Moving the Earth," by Herbert L. Nichols, Jr., published last year. Priced at \$15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at \$15 plus postage.

Ground pressure in rock tunnels is difficult or impossible to estimate. In firm formations there will be little or no pressure until depths over 500 feet are reached.

However there are soft, joined, or laminated formations that will scale

off or fall from a flat or moderately curved roof, until a Gothic or pointed arch develops, after which it will be self-supporting. If bracing is done only to support the roof, it is a question whether it will not be more economical to cut up to a stable roof line, and avoid placing of supports.

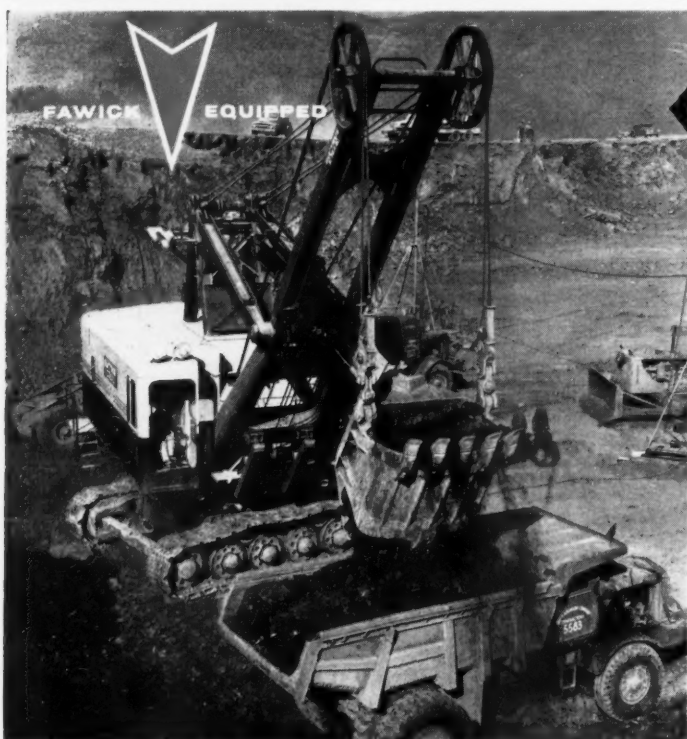
In any roof problem, width is a very important factor, as wide spans will drop pieces or fall in much more readily than narrow ones.

Many rock tunnels are perfectly safe without any bracing. Many others get by without accidents. But very often it is necessary to place supports directly after the digging, or within a few days. Also, the majority of tunnels outside of mines are more or less permanent in nature, and, except in very firm rock, will require lining to prevent deterioration and to reduce or eliminate maintenance.

Support or lining may be wood timber, steel ribs, plates or bolts, or concrete. Concrete is frequently placed inside one of the other types of support.

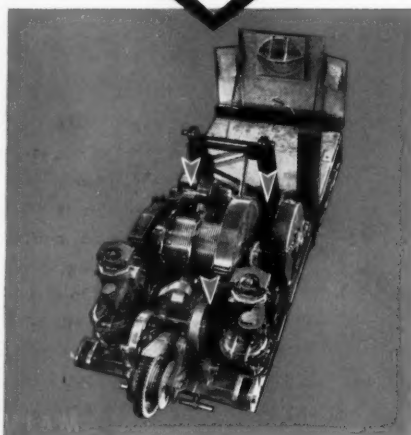
Timber is the oldest material used, and is found in ancient tunnels. Concrete was used to some extent by the

FAWICK *Products in Action* IN THE EARTHMOVING INDUSTRY



Bucyrus-Erie 150-B, 6 cu. yd. Power Shovel at work in California Quarry.

Deck Machinery of Bucyrus 150-B showing location of FAWICK Airflex Clutches.



FAWICK Airflex Clutches on BUCYRUS-ERIE Power Shovels Do More Work at Less Cost

Power shovel operators get highest operating efficiency through absolute control of the various working mechanisms. The power transmitted must be highly responsive, fast acting, and positive. Clutch couplings transmitting power on these machines must give peak performance over a long service life without shutdowns for lubrication or adjustment.

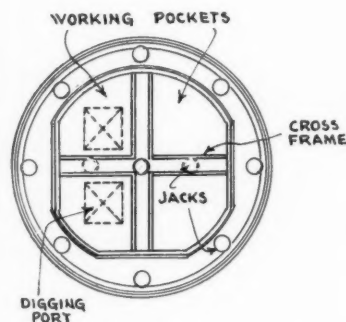
FAWICK Airflex Clutches do more work at less cost because:

- ... they transmit power instantly, positively, and smoothly from local or remote controls—with ample overload protection.
- ... they combine simple, compact design and rugged construction for easy installation and exceptional service life.
- ... they require no work interruptions for lubrication or adjustment for operating wear.

The installations of FAWICK Airflex Clutches on Bucyrus-Erie 110-B, 150-B, and 190-B Power Shovels are typical of FAWICK units providing top performance on heavy duty machines.

A call or letter to the nearest FAWICK representative or the Home Office will bring full information on all the advantages FAWICK power-transmission products can provide for your specific equipment.

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Cross section of tunnel, showing shield in mixed-face heading.

Romans, and has become the standard for permanent installations. Steel liners and roof bolts are quite modern developments, and are rapidly replacing timbering.

The square-set timber framing is confined to small tunnels, and various forms of arch construction can be used in quite large ones. The arch may be supported on posts imbedded in the floor, or rest on a springline shelf (hitch) cut in the sidewalls. Support may vary between these methods with changes in ground, or in shape of the edges.

Posts should be fastened to the wall plate by dowels, lag bolts, or scabs (nailed-on pieces) so that they cannot fall if relieved of weight.

The weight of timbering varies with expected ground pressure. Sometimes

Field Offices and Representatives in principal cities

For more facts, use Reader-Reply Card opposite page 18 and circle No. 430

it is merely a light roof to catch light rockfalls, at other times a high-strength lining designed to resist squeeze from all directions, including the bottom.

Where timbering ends at a portal, or at an enlarged shaft base, it must be securely braced by diagonal beams, so that any compression developing in the tunnel will not squeeze it out.

In rock or soil that tends to push in, it is important not to leave any space between the lagging and the wall or roof, as any inward movement will increase the instability of the ground, and may cause it to exert tremendously more pressure than if it had been held in its original position.

An exception is found in swelling or squeezing ground that is allowed a limited space for movement.

Initial movement is prevented by packing the space between the lagging and the rock. The most economical system is to use a dry packing of fine muck, which is shoveled behind the planks as they are placed. At the crown, it must be thrown in from the end and securely rammed—a tedious, disagreeable job that is seldom well done.

Steel ribs

Steel supports are now standard in tunnel work. They are easier to handle, and allow substantial saving in excavation. This is because for a given strength they are only half as thick, and the projections of ribs into a concrete lining are counted as reinforcing. In timber construction, the outside line of the concrete is figured as the inside line of the timbers, and the concrete used to fill out to the lagging is largely figured as waste. On small tunnels, the saving in excavation may be 30 per cent and in concrete about 50.

However, steel liners are more vulnerable to blasting damage, and do not give warning of impending collapse under load by groaning, as timbers do.

The steel ribs are made in two pieces, occasionally more. They are brought in endways and set up individually. The lagging may be wood planks or steel liner plates. If the former, the ribs must be well strutted to each other to keep them in line.

As in the case of wood, steel lining may be only a roof or crown support based on shelves at the spring line in the side walls, or a complete tunnel enclosure.

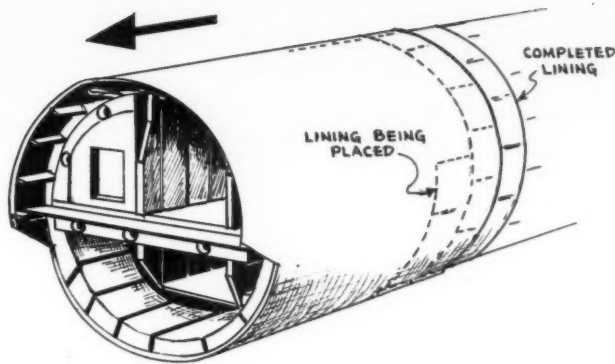
It has been found in mining and tunneling operations that unsafe rock will often support itself safely over wide spans if it is reinforced with steel bolts.

In laminated (thin bedded) formations, the effect is similar to that obtained in plywood and other layered wood constructions. Several weak and thin layers may be very strong when bonded together. In jointed and fissured rock, the bolts, if used properly and in sufficient numbers, restore to the rock the massive strength it had before it separated into blocks and pieces.

Expansion bolts are used, rather similar to those that fasten wood

framing to masonry. Ears on the bolt prevent it from sliding too far into the shell, so that tightening pulls the plug down into the shell, expanding it against the sides of the hole.

Washers, or plates of plain, tee-hole, and angle types, and roof ties are available for use under the head to prevent it from crushing into the rock, to spread the pull over a wider



Tunnel-driving shield.

bearing area, and to provide support between bolts. The tee-hole type permits passing over the head of the assembled bolt without removing the shell, where the others require separating them, putting the washer on the bolt, and reassembling. The holes in the roof ties are large enough to pass the shell, so that washers are required for each bolt that will be used.

This type of bolt does not require an exact-depth hole. Bolt and shell are inserted, and the head tightened with a torque of 150 to 200 foot-pounds, usually with an air-power impact wrench. This exerts sufficient pressure to bend the roof ties down

(Continued on next page)

Accurate Universal Joint Engineering Assistance—



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MECHANICS Roller Bearing **UNIVERSAL JOINTS** accuracy has met every aircraft need of the largest bomber and the smallest helicopter. When strategic aircraft requirements indicated a NEW type of universal joint, **MECHANICS** engineers developed it. Design, metals, machining, tolerances, heat-treating, hardening, stamina, balance and lubrication—all were adapted to aircraft precision. Design engineers may have the benefit of this universal joint know-how by sending for the aircraft bulletin shown at the right. Our general catalog, containing helpful universal joint engineering data and tracing kits, also will be sent to engineers, upon request. Let **MECHANICS** engineers help design and build universal joints that are exactly suited to the power transmission needs of your product. The competitive advantages that designed-for-the-job **MECHANICS** Roller Bearing **UNIVERSAL JOINTS** provide, are well worth investigating.

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(Continued from preceding page)

into any irregularities in the rock surface. The grip of the expansion shell in hard shale, sandstone, or limestone is usually in excess of the 20,000 to 24,000-pound breaking load of the bolt. In medium shale, it is said to vary between 14,000 and 22,000 pounds, and in soft wet shale between 6,000 and 13,000.

If the roof is too low to permit inserting a bolt of the full length required, short bolts and extension pieces can be used.

Bolting requires from one-fifth to one-tenth the steel required for ribs and lagging, and under many conditions is equally strong. In addition, it eliminates the need for excavating space in which to set the steel structure, and reduces the amount of concrete required for permanent lining.

Elimination of all ribs and timbering makes a tunnel easier to work in, as there are fewer obstructions, and it provides for a smoother flow of ventilating air.

Another important advantage is that the economy of the work causes it to be done on roofs that might be judged self-supporting if bracing were time-consuming and expensive. The bolts can also be installed right up to the face immediately after blasting, so that protection is available to the heading crew. As a result, their use in the rather wide range of conditions where they are applicable results in a marked decrease in roof-fall accidents.

Heavy wire mesh may be used to prevent falling of small fragments in between the bolts. In some instances gunite is used to minimize air-slacking and spalling.

Rock anchor bolts, which are similar to the slotted mine roof bolts, are used along highway and railroad cuts to prevent rock falls and slides.

Concrete lining

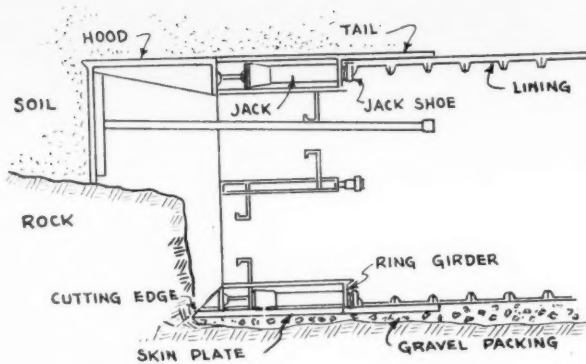
Installation of concrete lining is construction rather than excavation work (however necessary it may be to the excavation) and will be only briefly considered.

There are two general procedures—soft-ground technique, in which it is placed immediately behind the digging and is necessary to the driving of the tunnel, and hard ground. Under the second heading comes work in rock that is self-supporting and requires lining for permanence, sealing protection, or waterproofing, and unstable soil or rock that is adequately held in place by timber or steel.

The soft-ground technique is to follow the heading closely, with some resulting interference between operations. Perhaps the most serious is maintaining a track for muck cars through the pouring operation, and across the freshly laid invert (floor). Steel beam bridges may be used to carry the track in this section.

The invert may be laid about 1½ inches low, protected with planking, and brought up to grade with a top dressing of cement mortar as a finishing operation after the tunnel is complete.

Traveling forms of various types



Shield in mixed-face heading.

are used. For fast schedules, it is essential to have telescoping forms that can be folded up and moved through other forms supporting more recently poured sections. On other jobs, forms

are used that can be collapsed just enough to break away from the concrete surface so as to be moved ahead to the next section. In either case, the forms are carried on carriages that

may move on steel wheels and tracks or on rubber tires, depending largely on the muck haulage method used.

Breakthroughs

It sometimes happens, in spite of precautions, that there will be a sudden rush of water or mud into the tunnel. This most often occurs at the face immediately after a blast. Sometimes the source is a limited underground pocket which will give no trouble after it once drains off. At other times, a stream or large body of water will keep up a continuous flow. If the water is muddy, or the flow is partly or wholly mud, an unstable soil formation has been reached which may give increasing rather than diminishing trouble.

In any case, the first step is to seal

(Advertisement)

An ever-to solve power

Torque Converters

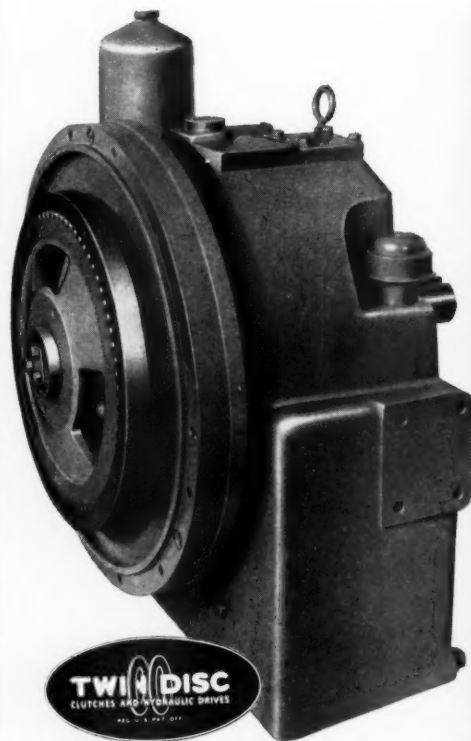
One of the first major manufacturers to apply torque converters to construction equipment was Allis-Chalmers Manufacturing Company. This was back in 1940, when Allis-Chalmers introduced its Model HD-14-C Tractor equipped with a Twin Disc Torque Converter.

Soon after this new concept in power transmission was introduced, however, the requirements of World War II channeled virtually all heavy construction machinery into military use. It was during this period that torque converter-equipped tractors truly came into their own . . . to meet the difficult construction demands of the rapidly changing Pacific Theatre of Operations.

After World War II, the torque converter quickly proved its worth in civilian duty as it had in military service. Within a relatively short time, construction men everywhere were well aware of the increased efficiency . . . the increased production . . . the over-all savings that could be gained through torque converter drives in construction machinery.

The torque converter multiplies engine output torque exactly as needed (the Twin-Disc Three-Stage, up to six times at stall, if required)—consequently, harmful, costly engine lugging and stalling are eliminated. Shock loads and destructive vibrations are cushioned out—through fluid connection—and power is automatically matched to load demand.

News of these advantages quickly spread in the construction industry . . . and, within just a few years time, torque converters became a well-accepted feature in all types of construction equipment . . . in shovels, in tractors, in loaders, in off-highway equipment—wherever the many advantages of torque converters could be applied.



announces new SINGLE-STAGE Torque Converters

Here's another good answer to the power transmission problems involved in today's construction equipment—the all new Twin Disc Single-Stage Torque Converter.

The new single-stage torque converter is currently available in the 1500 Series, which is applicable to engines producing from 30 hp at 1150 rpm to 198 hp at 2400 rpm. Four models provide various input and output combinations.

Already time-proved by extensive field tests, this single-stage torque converter is ideal for use in shovels, draglines, front-end loaders . . . in all types of construction equipment requiring smooth, efficient, dependable torque multiplication.

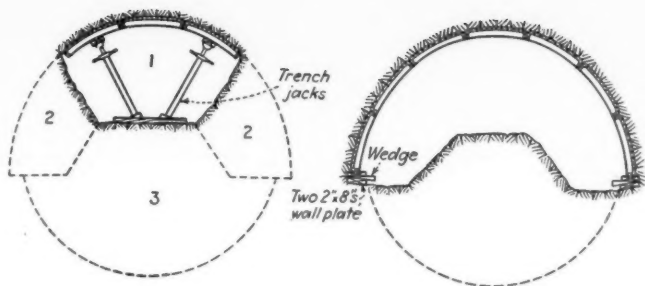
This new Twin Disc Torque Converter will cut operating costs . . .

boost profits . . . handle the toughest jobs with ease. The converter's smooth flow of power eliminates sudden load shocks between engine and driven equipment . . . cushions out harmful vibrations.

Specify a Twin Disc Torque Converter, single-stage or three-stage, in your next piece of construction machinery or when you repower your present equipment.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Tulsa



Setting liner plates.

off the face with a bulkhead (wall) as quickly as possible. Timber, sandbags, or sandbags with timber may be used. Occasionally timber may be backed with concrete.

The bulkhead must not be used as a dam while being built. Pipes should

be built into it large enough to take the water flow until the structure is complete. Otherwise water pressure will tend to destroy the bulkhead as it is being erected, and conditions will be very dangerous to personnel. With water discharge through pipes,

the structure can be properly and strongly made and keyed into the tunnel rim. The water can then be controlled by valves on the pipes.

The bulkhead should also be fitted with pipes for grouting and concrete placement. After the water has been shut off, grout can be injected into the space between the bulkhead and the break, and will sometimes work back along the water seam and stop or reduce the flow. Grouting may also be done through exploration holes drilled through the bulkhead and into the rock beyond. Over 90,000 bags of cement have been used to control one water pocket.

Further tunneling through such a spot is first in the form of drifts (small tunnels) each of which serves as a base for further grouting, until

the ground is consolidated enough to drive the big tunnel.

Soft-ground tunneling

Soft ground is divided roughly into the following subclasses:

Running ground, which must be instantly supported. It may be dry sand or gravel, quicksand, silts, and muds.

Soft ground, in which the roof must be instantly supported, but in which walls will stand vertically for a few minutes.

Firm ground, where the roof will stay up unsupported for a few minutes, and the side walls and face for an hour.

Self-supporting ground, which will stand unsupported while the entire tunnel is driven a few feet ahead of the timbering.

There are three standard methods of driving through soft ground: Forepoling with wood or steel, shield, and compressed air (plenum method). The third may be combined with the other two.

The use of plank forepoles was formerly the standard method of driving a tunnel through soft ground. While this technique has been largely replaced by steel liner and poling plates, it is still widely used on jobs that are too small to justify obtaining steel.

In forepoling, the tunnel is protected by timbering, and by breast boards set against the face. Planks are driven through slots cut in the breast board and supported cantilever fashion to make a temporary roof, under which dirt can be dug and permanent supports installed.

Forepoles may also be used with steel ribs instead of timber sets.

The standard soft-ground tunneling hand tool is a short-handled, round-pointed shovel, aided when necessary by a grub hoe (mattock), pickaxe, or crowbar, and often by paving breakers. Special grub hoes have one hammer face for use in driving wedges. In soft clay a curved two-handled draw knife can be used to advantage. It is pulled by two men or a power winch, and slices the clay off in strips.

Liner plates

Corrugated steel liner plates, curved to match the tunnel rim, and supplied with drilled bolt holes in flanges or overlaps for fastening to each other, are increasingly used for soft-ground tunneling. They are made in various sizes, with 16 x 36 inches in common use. A plate of this size made of 3/8-inch metal weighs about 27 pounds, and if 1/4-inch stock, 53 pounds. Short plates are available for fitting into the tunnel circumference.

Stiffening ribs are used when the tunnel is over 10 feet in diameter, and for heavy loads in any size opening. They are generally not used when the same strength can be supplied by a heavier-gage plate.

Liner plates are usually a temporary support to hold the tunnel until a concrete lining is installed, usually a matter of hours or a few days

(Continued on next page)

increasing trend to fluid drives transmission problems on construction equipment



This torque converter-equipped crawler tractor receives a smooth, flexible flow of power — enabling it to do more work in less time. The converter in this particular tractor incorporates Twin Disc Three-Stage Torque Converter components.

Fluid Couplings

Along with the rapid acceptance and the increasing demand for torque converter drives in construction equipment, a wide choice in other fluid drives became available through use of the fluid coupling. This fluid drive provides the shock-cushioning and the overload protection of torque converters but is for applications not requiring torque multiplication.

Like Twin Disc Torque Converters, Twin Disc Fluid Couplings transmit power through fluid, absorbing shock loads and harmful vibrations. Their chief advantage is for those applications to construction equipment with hard-to-start characteristics and where the engine must operate at its most efficient speed and output. Efficiency of fluid couplings is high, with a maximum "slip" of only 4% at normal operating speed and power output.

Conveyors, crushing equipment, winches, vibrating screens, cranes — these are just a few of the many types of equipment used in the construction industry that profitably incorporate Twin Disc Fluid Couplings.

A favorite type of fluid drive with construction men is the Twin Disc

Fluid Power Take-Off. For this reason, manufacturers like The Thew Shovel Co. have offered this fluid drive as standard for many models of their products for many years. The Twin Disc Fluid Power Take-Off mounts directly on the engine fly-wheel housing, making an efficient, economical, compact power package for shovels, draglines and other powered machinery.

Another commonly used fluid coupling is the Twin Disc HYDRO-SHEAVE® Drive. This unit combines the advantages of a fluid coupling and a sheave for V-belt drive — in a single, unusually compact package. It is available for engines and motors producing from 3/4 to 50 hp.

A Complete Line

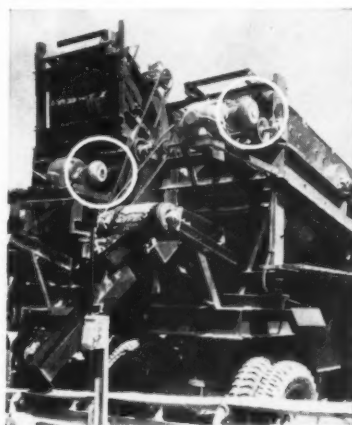
First to introduce the torque converter to this country, Twin Disc has maintained its leadership in the industry through the ensuing years. Therefore it's not surprising that the latest announcement of interest to construction men also comes from Twin Disc. It is a new line of single-stage torque converters. Currently available are the 1500 Series models for engines producing from 30 to 198



This power shovel is a typical application of Twin Disc Fluid Couplings on construction equipment. It benefits from the shock-cushioning characteristics of a Twin Disc Fluid Power Take-Off.

hp. Development of additional sizes of single-stage torque converters is in progress and their availability will be announced shortly.

In addition to the most complete line of fluid drives available, Twin Disc also offers a complete line of friction clutches — and recommends these drives when they are best suited to a particular piece of equipment on a particular job. For example, Twin



This vibrating screen works through another Twin Disc Fluid Coupling, the HYDRO-SHEAVE® drive. By picking up heavy starting loads smoothly and evenly, the HYDRO-SHEAVE protects both driving and driven equipment.

Disc Friction Clutches may be found on portable compressor units, mobile cranes, pumping units — in all heavy-duty construction applications where friction-type clutches prove most advantageous.

Yes, wherever you find construction equipment — from New York to Calcutta, from Seattle to Melbourne — you'll find Twin Disc Fluid and Friction Drives at work, solving the really tough problems involved in proper power transmission for construction equipment.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 432

(Continued from preceding page)

after the digging. They are sometimes "robbed" for re-use immediately before the concrete is placed. The safety of this practice depends on the character of the soil, which is a matter for engineers to pass on in each case.

Liner plates are placed from the top down. A small section is dug ahead, the center plate placed and braced with a post or jack; and then the sides dug away to place the adjoining plates. These are supported radially on cleated center blocks. When the spring line or base of the roof arch is reached, two 2x8 planks, called footing boards, are placed on each side. Wedges are driven between the two boards until they lift the arch of liner plates enough to take

the weight off the jacks. The lower plates are then nailed to the boards to prevent their slipping off.

If the ground is too soft for this method, interlocked poling plates can be placed outside and forward of the completed liner, and jacked forward from inside.

Shields

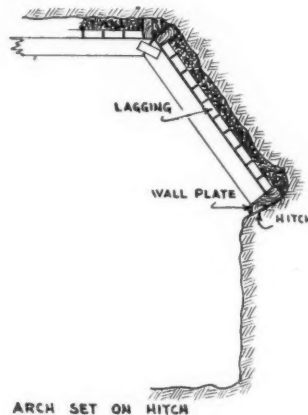
Shields have become the standard equipment for driving major tunnels in soft ground. These resemble a tin can with an open back and controlled openings in the front. The front may be open, with grooves to allow setting a breast board or plates if necessary, or closed by a bulkhead with controlled ports. The back or tail is large enough to permit placing the tunnel lining inside it.

The shield is forced forward into the dirt by jacks based on tunnel lining. Doors in the front are opened to allow soil to flow in, or to be shoveled. In very soft ground, where bulging of the surface will cause no damage (as under rivers or swamps), no dirt need be taken into the tunnel, as it will be pushed aside by the pressure of the shield.

A primary lining, which is most often of bolted cast-iron segments, but sometimes of cast steel (for unusual stress), fabricated plates, concrete blocks, or timber, is constructed in the tail, which is long enough to protect a complete segment. This lining must be strong enough not only to resist full soil pressure, but also to take the thrust of the jacks that move the shield forward.

The outside diameter of the shield tail must, of course, be larger than that of the lining built inside it. A few plastic soils can be manipulated so as to close in smoothly on the lining as the tail moves away from it, but under most conditions the space must be filled. Failure to do so will leave the lining without proper side support, so that the arch will tend to sag.

Grout was originally the standard filler for this space. Grout plug holes were built into the liner pieces. When the tail cleared them, grout was



Timber arch on hitch.

forced into the bottom hole, with the next above used as an air vent. When grout appeared at the upper hole, the grout hose was transferred there, the bottom plugged, and injection continued. The full circumference was worked in this manner from the bottom up.

The amount of cement used makes this operation costly, and in addition the grout has a tendency to move forward along the outside of the lining and flow under the tail into the shield. Also, grout may work up to the surface, cause heaving of pavements, or break into sewers or conduits.

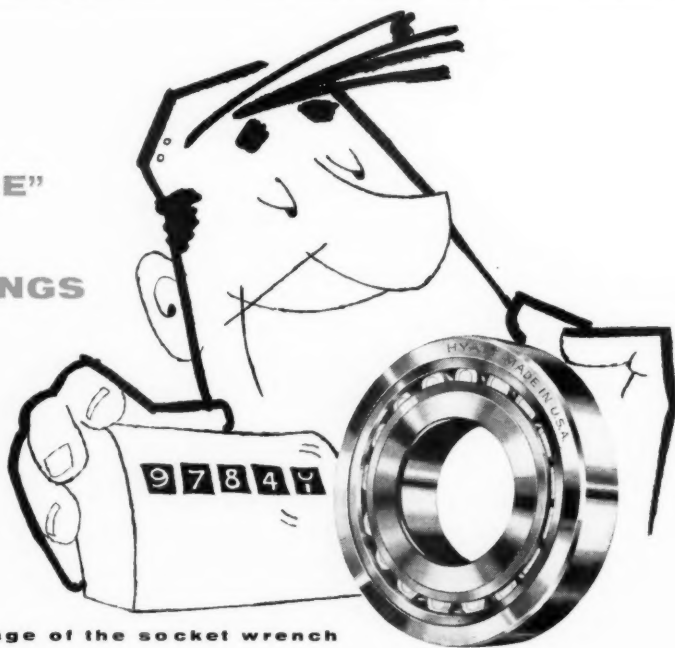
Gravel filling is now used to avoid these difficulties. Birds-eye gravel (uniform size, passing 1/4-inch screen, 33 per cent voids) or similar sizes of slag or screenings, can be blown by an air gun into the grout holes, also starting at the bottom. This will not leak into the shield nor travel far from the tunnel, but it may not fill spaces uniformly. It is therefore usually followed by regular grout. The quantity required is greatly reduced and its tendency to travel is checked by the presence of the gravel.

Compressed air

The compressed air or plenum method of tunnel driving makes it possible to work with relative safety in soft mud and under bodies of water. The principle is that the inward and downward pressure of water and of soils can be counteracted by increasing the outward pressure exerted by air in the tunnel.

The rule of thumb is that each 1/2 pound of air pressure over atmospheric pressure will support a one-foot height (head) of water. Actually, the pressure required is often far less, because of the stability of the soil, restriction of water passages, and other factors.

HOW TO GET MORE "MILEAGE" FROM YOUR ROLLER BEARINGS



by HY WHEELER, the sage of the socket wrench

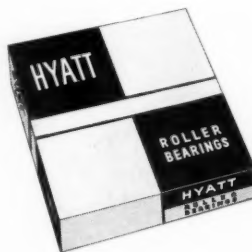
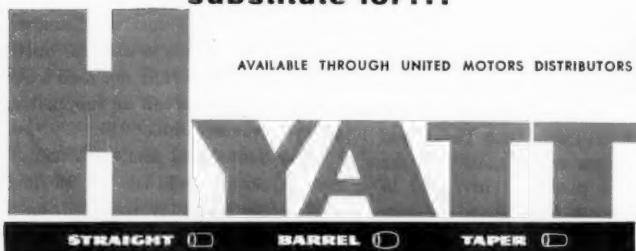
The way you *install* a roller bearing has a lot to do with the service life you can expect from it. Here are a few tips that can save you money, time and trouble in the long run:

1. Make sure the shaft seat and housing bore are *clean, smooth, and the right diameter.*
2. *Don't* remove bearings from the package until you're ready to install them.
3. *Lubricate* the surfaces of the bearing and machine part which are to be press fitted.
4. Start bearings on shaft with rounded

corner radius of race going first.

5. Direct the driving pressure *straight and square* through the race to be press fitted.
6. Drive races solidly up against shoulder of shaft and housing, but *never* hammer directly on races.
7. **BE SURE THE ROLLER BEARING YOU INSTALL IS A GENUINE HYATT.** When you mount a HYATT correctly you're sure of maximum "mileage"! Hyatt Bearings Division, General Motors Corp., Harrison, N. J.

Remember, when it comes to quality, there's no substitute for...



ROLLER BEARINGS

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The extra pressure is built up by low-pressure compressors (converters) at the surface, and piped through a retaining bulkhead into the tunnel. Men and materials are passed through this bulkhead through one or more locks. Air in the tunnel may leak out through the soil as fast as it is supplied, or may be exhausted from the heading through a blowline.

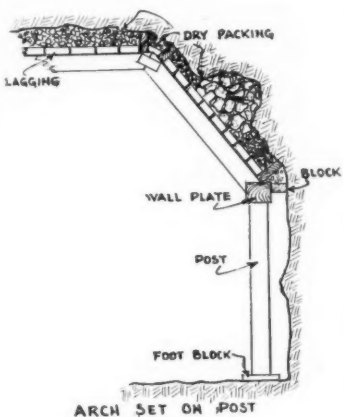
A lock is a passageway between two airtight doors. In entering the tunnel, the outer door is opened to admit men or materials. It is then closed, air pressure is raised to match that in the tunnel, and the inner door opened to complete the passage.

For exit, valves are opened to bring pressure in the lock up to that in the tunnel. The inner door is opened, the traffic moved into the lock, and the door is closed.

Air is then allowed to escape from the lock until it is at atmospheric pressure. The outer door can then be opened.

This device permits maintenance of pressure in the tunnel, and limits traffic air loss to the relatively small amount in the lock at each use.

It is best practice to have at least two locks, one for men and one for materials. The men's lock should be large enough for the whole crew, and must have valves by which pressure can be closely controlled so that it will drop gradually for minutes or hours while men leaving the tunnel are in it. This process of gradual reduction, called decompression, is necessary to prevent nitrogen dissolved in the blood from being suddenly liberated to cause a painful and sometimes fatal ailment called the bends.



Timber arch on posts.

There may also be a small emergency lock, high in the bulkhead so as to be the last place flooded. This is left open to the high pressure, so as to be ready for immediate use. One or more cross partitions may be placed in the crown to hold air pockets in case the tunnel should be flooded.

The materials lock should be long enough to accommodate hauling units of the size used. It may be small, so that one car at a time is pushed by hand in one end, and then pulled out the other, or it may be as much as 80 feet long, to accommodate a train and a locomotive. Lock construction is expensive, but a liberal size speeds work greatly.

Fire danger under high air pressure is severe. The extra supply of

oxygen in close contact may cause even wet wood to burn vigorously. Smoking and other fire hazards must be avoided, and there should be a liberal supply of fire extinguishers and fire hose connected to high-pressure water.

Clay reacts most satisfactorily to compressed air, as it is so nearly impervious that it is well supported by the air, and seals it in. Primary bracing may not be required before placing the permanent lining.

On first exposure to compressed air, silt acts like clay, but it then tends to dry out and crumble off at the top, and to turn to mud and flow at the bottom. The higher the tunnel, the greater the differences between top and bottom behavior.

This is because the air pressure is

the same on all parts of the tunnel rim, but the head of water that tends to force water into the tunnel, or resists its being forced out of the lining soil, is much less at the top than at the bottom. A partial cure for the difficulty is to excavate the upper or arch section first under low pressure, install liner plates or other support, then increase pressure and dig the bottom. Once a full lining is installed, the unbalanced condition becomes unimportant.

In sand, the air penetrates several feet at the top, and leaves the bottom wet enough so that boards have to be stuffed with excelsior to stop sand runs. The best cure for this condition is to drive wellpoints ahead of and below the face, and keep the lower sand dry until such time as lining is

placed.

Air will escape in any formation except tight clay, and will reach the surface by following porous veins, old wells, or even sewers. It is best conserved by getting the lining in immediately after the digging. Airtightness of the lining is not automatic, however. Grouting outside it (which is necessary for firmness also) and painting the inside of concrete with cement and water greatly reduce leaks.

Liner plates may be made airtight by spreading wet clay along the joints. Building paper can be used on wood lagging.

About 20 cubic feet of atmospheric air per minute is required for each square foot of face area, with an addi-

(Concluded on next page)

safeguard workmen... save materials... with



Today, there's a modern way to make re-bar ties that not only increases the safety of your workers, but also reduces job costs. That's the use of Cal-Tie Wire in handy reel dispensers.

Safety conditions are improved because there are no clumsy shoulder coils to catch on protruding objects and throw workers off balance... no loose ends to injure eyes or scratch workers. And—by eliminating this old-fashioned method—you reduce waste resulting from excessive cut ends and coils put down and forgotten.

You keep worker efficiency high, too. Light and compact, Cal-Tie Wire on reels can be used in tight quarters. Kinking and tangling of wire does not occur. Cal-Tie Wire in reels is always handy but never gets in the workers' way.

Try this up-to-date re-bar tying method—Cal-Tie Wire in handy reel dispensers—on your next construction project.

Cal-Tie Wire, manufactured by CF&I from its own steel—from ore to finished product—is available in gauges 14 through 20, annealed or galvanized. It fits all standard tie wire dispensers. For additional information, contact our sales office or the nearest CF&I distributor.

CAL-TIE WIRE in handy reel dispenser



CAL-TIE® WIRE

THE COLORADO FUEL AND IRON CORPORATION

3593

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(Continued from preceding page)

tional allowance for losses through the locks.

Sometimes the compressed air in the tunnel blows out the surface. This is particularly likely to occur in shallow tunneling in soft underwater mud. Any outward leak must be immediately plugged with any material on hand, valuable or otherwise. From the outside, a blowout can be prevented or stopped by dumping enormous quantities of clay from barges.

The blowout can be disastrous in itself, hurling men and equipment up into the water. The immediate drop in pressure allows water and mud to enter the tunnel, threatening those in it with drowning or suffocation. A job "lost" in this manner is expen-

sive and tedious to resume, and sometimes driving can be more easily done on a different route.

(To be continued next month)

Pavement-breaking tool with long-wearing point

■ The Vulcan Tool Mfg. Co. has developed a new pavement-breaking tool said to work faster and stay sharp longer.

Results of field tests with the Superkut chisel show that it breaks concrete 50 per cent faster than any other tool, according to the manufacturer.

The wedging action of the Superkut reportedly enables it to cut through heavy mesh or reinforcing rods without fouling or jamming. It



is also said to do a quicker job on asphalt, brick, or cobblestone pavement, and to enable workmen to accomplish more work with less fatigue.

Forged from high-grade steel, and hardened to rigid specifications, the Superkut chisel stays sharp 8 to 10 times longer than conventional mool points, the company declares.

For further information write to the Vulcan Tool Mfg. Co., 35-43 Liberty St., Quincy 69, Mass., or use the Request Card at page 18. Circle No. 155.

Bituminous paver

■ A catalog details the Pioneer Engineering Works' Vibromatic, a bituminous paver that gives controlled compaction and uniform density of mat to a highway or street. The catalog states that the screed and compactor, a toothed strike-off bar and pre-compactor, meters out the amount of material required for the thickness of mat, and by means of oscillation and vibration, fills in the voids across the entire width of mat being laid. Some of the outstanding features listed are controlled compaction and depth, crown adjustment, the ability to handle any asphalt mix, and traveling speeds up to 232 feet per minute forward and 100 feet per minute in reverse.

To obtain Form 655-1 write to Pioneer Engineering Works, Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 25.

Lights flash alternately in new warning device

■ A highway-construction warning device that makes use of the principle of alternately-flashing lights, such as are found at railroad crossings, has been introduced by the Davis Emergency Equipment Co. Actual testing, the company advises, has determined that the alternating lights have more attention-attracting value than the brightest single light.

The Wig-Wag highway flasher is available for either battery operation or for 110-volt ac or dc power line or generator operation. A plastic magnifying lens intensifies the brilliance of the battery-operated unit.

Also available are single lights with clamps. Stands can be purchased or the lights can be attached to existing stands or barricades.

For further information write to the Davis Emergency Equipment Co., 43 Halleck St., Newark 4, N. J., or use the Request Card at page 18. Circle No. 110.

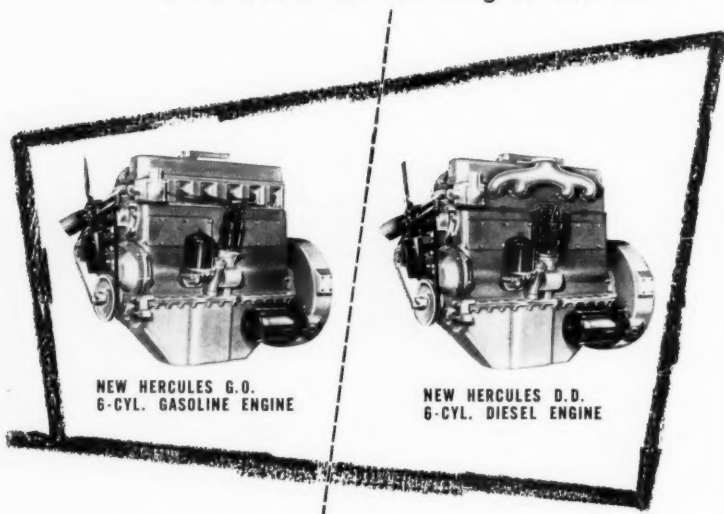
Overhead sign supports

■ Monotube sign supports for highways, freeways, turnpikes, and expressways are featured in a catalog from The Union Metal Mfg. Co. The supports, available as double-pole units for span-type sign mounting or as single-pole units for cantilever or center mounting, are designed to withstand heavy winds and ice, according to the catalog. Units diagrammed are the span-type double-sign posts, cantilever-type single-sign post, center-mounted type single-sign post, and galvanized sign bracket assembly. Specification charts accompany each diagram.

To obtain Catalog No. 88 write to The Union Metal Mfg. Co., 1400 Maple Ave., Canton 5, Ohio, or use the Request Card at page 18. Circle No. 137.

WHEN YOU BUY AN ENGINE

... what's the first thing to look for?



Of course, some people look at the "outside" of an engine and see only a nice shiny paint-job. But that's not too important. Other buyers look at what's "inside" an engine. That can be very important. However, we think a buyer should also look at what's "back of" an engine. That's why we at Hercules Motors Corporation guard the enviable reputation we have earned in more than 41 years of engine building experience.

Hercules' reputation isn't merely a way of doing business or just the top quality of our product. We feel that our reputation means more than good business ethics and a quality product. Our reputation also means supplying new and better engines to meet the various needs of our customers.

As an example, our new line of INTERCHANGEABLE engines gives the customer the choice of gasoline or diesel power without changing engine mountings in the end product. These new G.O. (Gasoline Overhead valve) and D.D. (Direct injection Diesel) engines, not only have the same mounting dimensions in engines of the same number of cylinders, but many component parts are also interchangeable over the entire range of these new models.

Years of engine building "know how" stand "back of" every Hercules Engine. In addition, our wide selection of more than 90 models of engines and power units, available for operation on gasoline, diesel fuel, natural gas, L.P.G. and kerosene, provides a dependable source of power for all requirements between 3 and 500 H.P.

For help in solving your power problems, contact our factory. Our sales-engineers will be glad to assist you. No obligation, of course.

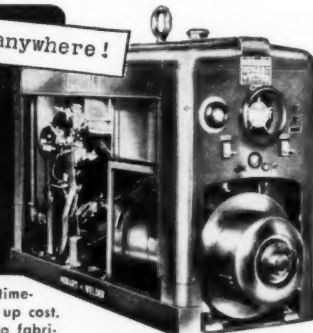
HERCULES MOTORS CORPORATION

CANTON 2, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 435

Cut Welding Costs with this Contractor Special welder

Welds anywhere!





Do the job faster, better with Hobart. You'll avoid time-consuming breakdowns that delay the job and roll up cost. Hobart Gas Drive Welders are used anywhere to fabricate steel or repair equipment. No need for power—they provide their own. A type and size for every construction job—large or small.

Many contractors standardize on the 250 amp "Contractor Special." A full capacity 250-ampere welder, yet compact and lightweight for easy moving from job to job.

Others like the combination AC Arc Welder and AC Stand-by Power Unit. Welds or powers lights, tools.

For extra heavy duty welding, contractors favor the Hobart DC Gas Drive Welders ranging up to 600-ampere capacity with many combinations of auxiliary power. Check and return the coupon today for complete details!

HOBART TROY OHIO WELDERS

Tear off and MAIL TODAY!

• HOBART BROTHERS CO., Box 866, Troy, Ohio, U. S. A. Telephone 21223

Without obligation, please send information on items checked.

☐ "Contractor Special" ☐ AC Arc Welder-AC Power Unit

☐ DC Gas Drive Welders ☐ Electrode samples for _____

NAME _____ POSITION _____

FIRM _____

ADDRESS _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 436

Case history

Use of calibrator cuts cost of steel erection

A comparison of two of their jobs by Vogt & Conant Co., steel erectors of Cleveland, Ohio, showed a substantial savings on bolt installations when impact wrenches were checked with a Skidmore-Wilhelm calibrator.

"Since making the Skidmore-Wilhelm calibrator a standard piece of equipment on our structural steel erection jobs where high-tensile bolts are used, we have realized a savings of 13.5 per cent on our bolt installation cost," James A. Conant, company vice president, reports.

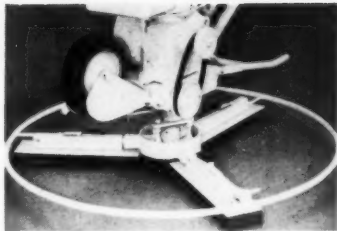
He cites the steel erection job the firm did on the Ohio Oil Co. office building at Findlay, Ohio. There, inspection of bolts accounted for 16.5 per cent of their installation cost. But on the recently-completed Arthur G.



A workman checks an impact wrench on a Skidmore-Wilhelm calibrator.

McKee building in Cleveland, inspection costs with the S-W calibrator amounted to only 2 per cent.

For further information on the calibrator write to Skidmore-Wilhelm Mfg. Co., 442 S. Green Road, Cleveland 21, Ohio, or use the Request Card at page 18. Circle No. 191.



White Mfg. Co. now offers a grinding blade for its Model T-1 Troweler.

Rotary trowel now uses grinding blade, blocks

■ The White Mfg. Co. has announced a new grinding blade as an accessory for the Model T-1 Troweler.

The special blade attaches in the same way as the cement-finishing blade—in a matter of seconds and without tools of any kind. This grinding blade uses a $1\frac{1}{2} \times 3\frac{1}{2} \times 8$ -inch grinding block. The stone is replaceable.

According to the manufacturer, the new blade is ideal for surfacing rough concrete, for handling terrazzo, or wherever a grinding machine is necessary.

For further information write to the White Mfg. Co., 1227 W. Beardsley Ave., Elkhart 9, Ind., or use the Request Card at page 18. Circle No. 154.

Radio transceiver

■ A radio transceiver, the Model JRC-400, that can cover distances upwards of 10 miles, is featured in a mailing piece from the Vocaline Company of America. The portable unit weighs 4 pounds, and operates on any 115-volt ac or 6-volt dc power supply. The literature states that the unit is FCC approved.

To obtain the mailing piece write to the Vocaline Company of America, Old Saybrook, Conn., or use the Request Card that is bound in at page 18. Circle No. 123.

New sump pump operates when totally submerged

■ Two models of a new submersible sump pump, engineered for use wherever a totally-submerged sump pump is required, are announced by Lancaster Pump & Mfg. Co., Inc. One model is all bronze and the other is a cast iron, cadmium-plated, bronze-fitted pump.

The Lancaster Drain-Pak is equipped with a $\frac{1}{2}$ -hp, 60-cycle, 110-volt motor with automatic overload protection. It comes with an 11-foot, rubber-covered power cord.

For further information write to Lancaster Pump & Mfg. Co., Inc., Lancaster, Pa., or use the Request Card that is bound in at page 18. Circle No. 71.



The Lancaster Drain-Pak submersible sump pump operates on a $\frac{1}{2}$ -hp, 60-cycle, 110-volt motor.

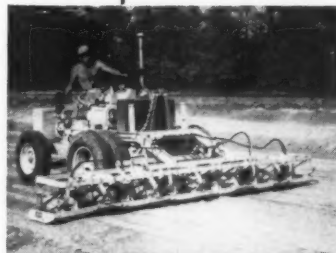
4200

TWO-TON BLOWS PER MINUTE!

Here's TREMENDOUS COMPACTION

... for rapidly and most economically achieving or exceeding specified densities in the consolidation of rock, slag, gravel and sand base courses in waterbound and penetration macadam construction. The Jackson does it in just about half the time required with equipment of other types and is equally efficient in filling all the voids from top to bottom of rock and slag courses when sufficient fines have been spread.

Exceptional ON-THE-JOB ADAPTABILITY!



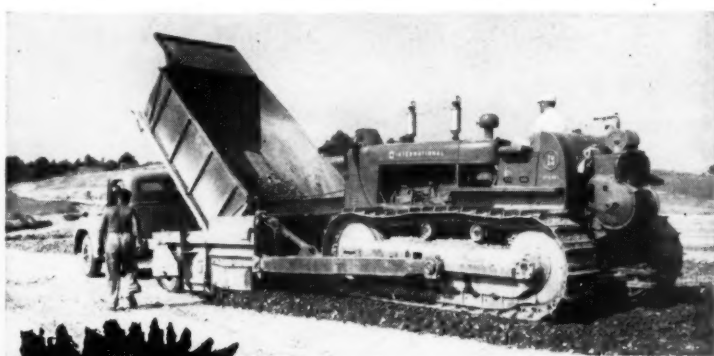
Above: a Jackson Multiple (6 units) on 7 mile sub-grade. Below: 2 units equipped with operating handle, self-propelling and easily operated by one man.



Standard width of the Jackson Multiple is 13', 3"; working speeds: up to 60' per minute; reverse: up to 5 MPH. Working width can readily be altered on the job to exactly suit narrower requirements such as widening projects. As many of the 6 compacting units as desired can be subtracted from the workhead, quickly and easily. Furthermore, easily interchangeable bases from 12" to 26" are available and individual compacting units may be fitted with operating handles and used exactly like the standard, highly popular, self-propelling manually guided Jackson Compactor. As a consequence Jackson equipment can be used on a great deal of work other machines cannot reach. If you have any job requiring compaction of granular soil, it will pay you to know specifically what Jackson Vibratory equipment will do. See your Jackson distributor. Literature and name of nearest Distributor on request.

JACKSON
VIBRATORS, INC.
LUDINGTON, MICH.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 438



**Owners report
up to 1000 tons
per hour with a
Jersey
Spreader!**

In conjunction with the propelling tractor, a Jersey Spreader is the **FASTEST, ACCURATE PAVING Spreader** in the World! . . . It is capable of spreading up to 5,000 tons of aggregate daily—easily and economically . . . It has been successfully used on such projects as: the New Jersey Turnpike, the Ohio Turnpike, the West Virginia Turnpike, the New York Thruway, the Garden State Parkway, Chrysler Tank Testing Bowl, many of the most important new airports and on large defense bases in Iceland, Newfoundland, Arabia and Africa.

Write now for complete information and illustrated literature.
MANUFACTURERS OF THE JERSEY SPREADER

JERSEY SPREADER
TRACTOR SPREADER COMPANY
HASBROUCK HEIGHTS, NEW JERSEY

REG. TRADE MARK

For more facts, use Reader-Reply Card opposite page 18 and circle No. 437



Case history

Seven men, several rigs replaced by backfiller

Van Doren Bros., contracting firm of Richmond, Va., recently backfilled and compacted approximately two miles of 2-foot-wide, 4-foot-deep trench for a 6-inch gas line with just one man and a Cleveland 80W backfiller with tamper unit attached. Before purchasing the Cleveland rig, the firm had to assign seven men, a rubber-tired dozer, a pair of compressors, and four pneumatic tampers to the same task on similar jobs.

"It's a great time-saver," is F. M. Van Doren's comment on the performance of the 80W.

On another job, involving a 12-inch water-line trench approximately 6 feet deep, the Cleveland machine saved considerable time and money through its ability to backfill soil deposited on a down slope on the far side of the trench. The 80W backfills from either side of the trench while moving parallel to it.

The tamping unit delivers a 480-foot-pound blow 42 times a minute, compacting fill so thoroughly and uniformly that it can immediately be paved in many cases. The unit is optional extra equipment with the backfiller.

For more information on the 80W backfiller write to the Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 1, Ohio, or use the Request Card at page 18. Circle No. 195.

Corrugated cut-off wheel acts like toothhead saw

A cutoff wheel with the diamond section corrugated has been introduced by the Corrugated Diamond Saw Co. The setting design acts like saw teeth, thus combining the features of a conventional cut-off wheel and a toothhead saw.

The high spots of the corrugation provide ten times as many contact points, with intermittent cutting action. At the same time, the low spots build channels for smoother flow of coolant and quicker release of sludge, according to the manufacturer.

For cutting concrete or cinder block, a very dense tungsten-carbide bond is used, adding to the abrasive action. The wheels are made to order to fit any saw on the market.

For further information write to the Corrugated Diamond Saw Co., 201 Moonachie Road, Moonachie, N. J., or use the Request Card at page 18. Circle No. 144.

A Cleveland 80W backfiller replaced seven men and several pieces of equipment on back-filling jobs for the Richmond, Va., contracting firm of Van Doren Bros.

Larger, quieter muffler now standard equipment

A new, large 125-son muffler has been made standard equipment on all International R-line trucks equipped with Red Diamond engines. The manufacturer states that the muffler meets the sound quality and volume standards established in the AMA Truck Noise Subcommittee, and also complies with minimum noise restrictions contained in many city and state codes.

Measuring 8½ inches in diameter and 38 inches long, the muffler has baffle plates made of heat and corrosion-resistant aluminized steel. The

mountings for the muffler incorporate rubber bushings and are well away from exhaust heat, insulating normal exhaust-system vibrations and noises from the frame and cab.

The muffler and mountings can also be installed on International R-line trucks now in use that have the improved-power Red Diamond engines.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 88.

5

"Euc" REAR-DUMPS



10-Ton

The Model UD has a 6½ cu. yd. body and rated payload of 20,000 lbs.—a quarry body with flared sides is available for rock work. Designed for smaller mine, quarry and construction work, this Rear-Dump has a 128 h.p. engine and 10-speed transmission providing a top speed of 36 m.p.h. Drive axle is spring mounted—tires are 11.00 x 24 front with 12.00 x 24 rear duals.



15-Ton

There are two models of this capacity "Euc". One has a 10 cu. yd. body, 165 h.p. engine, semi-rigid drive axle and manual steering—the other has a 218 h.p. engine, 10½ yd. body, spring mounted drive axle and hydraulic steering. The latter model can be equipped with larger tires to increase the rated payload to 18 tons. Both have 5 speed transmissions and 14.00 x 24 tires standard—a quarry body for either model is available.

22-Ton

Practically a "standard" on larger quarry, mine and heavy construction projects, the Model TD "Euc" has a 300 h.p. engine, spring mounted drive axle, and 15 yd. body. Tires are 14.00 x 24 front with 18.00 x 25 duals rear. Hydraulic steering is standard, and a quarry body is available. This "Euc" can be equipped with a 10-speed transmission or Torqmatic Drive—it's a top performer on the toughest jobs.



Portable electric mixer operates anywhere on job

■ A portable mixer that allows builders to mix concrete, plaster, and other materials closer to their work has been introduced by the Master Vibrator Co.

The Handy Mixer utilizes a portable electric mixing unit that is inserted into a large metal tub. The mixing unit slides into a receptacle in the tub, and the entire mixer can be assembled in 30 seconds. The tub has a capacity of five bags of pre-mixed aggregate.

The Handy Mixer is powered by a



The Handy Mixer consists of a portable electric mixing unit in a large metal tub.

1-hp motor, and can be operated wherever there is a 115-volt outlet. No component of the mixer weighs more than a single bag of premixed plaster.

For further information write to the Master Vibrator Co., 561 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 104.

Concrete form panels set up quickly, easily

■ A new way to build concrete forms, using 1½-inch plywood panels equipped with special fasteners and joined by steel clamps, is announced by FormCo., Inc.

This method is designed to provide a sturdier and more easily constructed form for use on all types of foundations, as well as on bridges, reservoirs, and culverts. The new assembly process is said to be especially applicable for stepped-up footings, pilasters, columns, and beams.

According to the manufacturer, contractors report a reduction in labor costs from 45 cents per square foot of form, using other types of forms, to only 5½ cents per square foot with FormCo construction.

The 7 or 9-ply panels which form the walls are 1½-inch concrete-form plywood, weighing approximately 3 pounds per square foot, which is pre-fitted with special, rust-resistant



Concrete-wall forms made of FormCo plywood panels support a pour.

Phillips Head bolts counterbored into the plywood and held in place by a nut. The formed, non-warp steel clamps which hold the panels together are quickly and easily attached to the plywood at the job site by means of a bolt which fits into the threaded Phillips Head.

For fastest possible erection, inner or outer walls may be constructed separately or simultaneously. The interchangeable panels and steel clamps may be used either horizontally or vertically, and the clamps are provided with a grooved slot for holding the snap ties. Because highly accurate alignment of the form is said to be achieved, the finished walls require little or no rubbing.

For further information write to FormCo, Inc., 402 Rockford Trust Bldg., Rockford, Ill., or use the Request Card at page 18. Circle No. 162.

Cleaver-Brooks appoints new plant superintendent

The Cleaver-Brooks Co., Milwaukee, Wis., has appointed Henry E. Little general superintendent in charge of operations at the firm's new Lebanon, Pa., plant, now under construction. Little was formerly associated with the Phoenix Iron & Steel Co., Harrisburg, Pa.

The new plant will serve as an eastern branch assembly plant and will manufacture a line of heating boilers. It will be in operation this summer.

—For more facts, circle No. 439

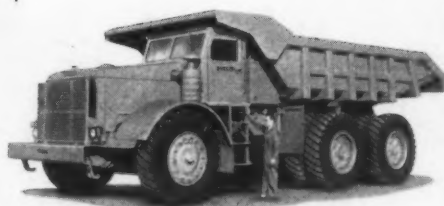
10 to 50 TONS—128 h.p. to 600 h.p.

A Complete Line of Off-highway Haulers



34-Ton

This Twin-Power tandem axle "Euc" has two engines providing a total of 400 or 436 h.p.—each engine drives an axle through a separate Torqmatic Drive. The exhaust heated body has a capacity of 24 yds. Tires are 16.00 x 25 front, with 16.00 x 25 rear duals in tandem. For jobs where large loading equipment is used and big loads must be hauled, the Model FFD has no equal for low cost production and performance.



50-Ton

Largest Rear-Dump hauler in standard production, the Model LLD Euclid is designed for the biggest, toughest jobs. It has two engines, providing a total of 600 h.p.—each of the spring mounted drive axles is driven through separate Torqmatic Drives. The exhaust heated body has a 32 yd. capacity. All tires are 18.00 x 33. Twin Euclid hoists have ample power to raise the fully loaded body fast for quick, clean dumping.

CONSTRUCTION, MINE, QUARRY and INDUSTRIAL WORK

Rear-Dump "Eucs" are the outstanding choice for moving heavy excavation on the toughest jobs because they are built exclusively for off-the-highway service. They have the capacity, power and speed to haul big loads faster and at lower cost per ton or yard moved.

The simple, rugged construction of Euclid Rear-Dumps pays off in long life and low maintenance cost. There's less down time for repairs... more work-ability. These "Eucs" have engines of 128 to 600 total h.p.... single and tandem drive axles... standard or quarry type bodies... gear transmissions and Torqmatic Drive... spring mounted and semi-rigid drive axles... top speeds, with full payload, up to 36 m.p.h.

Wherever you see Rear-Dumps in off-highway work, it's almost a sure thing they are "Eucs" because Euclid has been the leader in this field for over 20 years. There are more Rear-Dump "Eucs" in service than all other makes of off-highway haulers combined. Have your Euclid dealer supply helpful data on this complete line of Rear-Dumps and other Euclid earth moving equipment... you may find, as hundreds of owners already have found, that Euclids are your best investment.

Rear-Dump "Eucs" are your best bet

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Preventive work keeps equipment fleet rolling

Status board and standardization of equipment make for smooth-running maintenance operations



One of Seaboard's resident mechanics uses a General Electric two-way mobile radio to call for a needed part. The system coordinates work within 50 miles of headquarters.

C&E Staff Photos



Field joints with Beth-Cu-Loy only a matter of minutes

Bolts, a band of Beth-Cu-Loy, and a hand wrench are all you need to make a tight culvert joint right in the field.

Compare this with the man-hours needed to assemble an equivalent culvert of any other material!

Ease of assembly is only one of many reasons for the growing use of drainage pipe made of Beth-Cu-Loy galvanized sheet. The strength of steel permits the use of relatively light-weight material, so that handling is simpler and costs less. Long lengths are feasible, too,

reducing the number of joints and speeding up installation of the pipeline.

Trenching can be less finicky because Beth-Cu-Loy pipe is flexible regardless of diameter, easily conforms to grade and alignment. Further, it flexes with the fill to equalize loads around it, and absorbs vibration, impact and shifting actions due to weather.

The copper in Beth-Cu-Loy sheets, along with the heavy zinc coating, provides a double defense against corrosion. Pipe and culvert fabricated from this

steel give long and trouble-free service. Bethlehem manufactures the Beth-Cu-Loy galvanized corrugated and flat sheet stock used by pipe fabricators. If you would like to have more information about Beth-Cu-Loy or the names of those who can supply pipe made from it, just call our nearest sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



For more facts, use Reader-Reply Card opposite page 18 and circle No. 440

A status board, resembling one that might be found in any Army motor pool, is one of the features of a maintenance setup that is keeping some 200 pieces of equipment in top-notch condition for Seaboard Construction Co., Brunswick, Ga., at all times. Making the firm's maintenance job simpler is the company's practice of standardizing on one make of equipment.

The status board, a blackboard listing all equipment requiring maintenance, shows at a glance the state of equipment at any given moment during the day. It shows when a rig is due for preventive maintenance, just what equipment is needed at one of the projects being handled by the firm, and when the last work was done on each unit.

In brief, the status-board system works this way: each piece of equipment is numbered, and as soon as it requires maintenance, its number appears on the board. Next to the column containing equipment numbers are seven columns, one each for type, date lubricated, date oil filter changed, date oil changed, date fuel filter changed, battery service, and status.

A diagonal line in the status box shows that maintenance on a piece of equipment is one day to one week overdue. A cross in the status box indicates that maintenance is a week or more overdue. Equipment in the latter category is, of course, given priority by mechanics. A record of overdue equipment is constantly checked with the mileage and hour records of each unit. These records are kept by the service or truck mechanic responsible for the equipment on a particular project.

Equipment standardization

Seaboard's efficient and precise inventory setup, allowing mechanics to get needed parts in a hurry, is in large part due to the standardization of equipment used by the firm. Parts for only one particular make of machine have to be stocked; there is no need for storing many parts for various makes of equipment.

Each mechanic turns in a daily report on all work performed and all parts drawn from the stockroom. This information is posted to individual equipment files located in the stockroom. A day-by-day record is kept not only on parts and labor, but also on whether parts were drawn from the stockroom, whether parts were new or rebuilt, and the number of parts used. As new or rebuilt repair parts are drawn out of the stock room, the mechanic lists them on his report, which shows the particular piece of equipment in which they are being used. When his report is turned in, the information is posted on the individual file of the equipment, and the part used is marked off the inventory file.

This listing of time, labor, and repair parts for each piece of equipment makes it possible to determine the cost of maintaining one particular unit. It also makes it possible for the contractor to take advantage of warranties. If, for instance, a piece of equipment breaks down due to a faulty generator, it is easy to find out when

CONTRACTORS AND ENGINEERS

the generator was installed, whether it was new or rebuilt, and if it was new—whether or not it carried a warranty.

This might seem to involve a lot of costly paper work for some trivial item, but the system is so simple that it more than pays its own way. The majority of breakdowns on construction projects are usually due to such small items as generators, clutches, and pumps that ordinarily carry warranties. Taking advantage of all the warranties provided by manufacturers of parts, Seaboard has saved money throughout the course of a year on its fleet of equipment.

The Kardex files, as well as the individual equipment files, are kept in the stock room. Each Remington Rand card in the Kardex system has such information as the location of a part, the quantity of parts in stock, and parts numbers. Other cards show complete built-up units, as well as such construction materials as bolts,

and Worthington units. All pneumatic tools, such as hammers, are Ingersoll-Rand. Welding apparatus consists of Lincoln 300-amp and P&H machines. A limited number of other units, such as International trucks, Northwest draglines, and LeTourneau scrapers are being used.

Job and shop maintenance

Seaboard's equipment superintendent, Robert D. Ricketson, meets with various construction superintendents in the office of H. J. Friedman, president of the company, where ground-work is laid for future or present projects. Here, Ricketson gathers all information needed to carry out maintenance operations on equipment that will be required for work. After con-



The firm's Ford service truck, equipped to repair any tire damage in the field, carries Alemite reels for field lubrication, hand pumps for diesel and motor fuels, and an air compressor driven by a Wisconsin engine.

NO.	TYPE	LOCATION	DATE	REMARKS	NO.
1	TRUCK	10/10	11/3	REPAIR	11
2	TRUCK	10/10	11/3	REPAIR	12
3	TRUCK	10/10	11/3	REPAIR	13
4	TRUCK	10/10	11/3	REPAIR	14
5	TRUCK	10/10	11/3	REPAIR	15
6	TRUCK	10/10	11/3	REPAIR	16
7	TRUCK	10/10	11/3	REPAIR	17
8	TRUCK	10/10	11/3	REPAIR	18
9	TRUCK	10/10	11/3	REPAIR	19
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78	TRUCK	10/10	11/3	REPAIR	88
79	TRUCK	10/10	11/3	REPAIR	89
80	TRUCK	10/10	11/3	REPAIR	90
81	TRUCK	10/10	11/3	REPAIR	91
82	TRUCK	10/10	11/3	REPAIR	92
83	TRUCK	10/10	11/3	REPAIR	93
84	TRUCK	10/10	11/3	REPAIR	94
85	TRUCK	10/10	11/3	REPAIR	95
86	TRUCK	10/10	11/3	REPAIR	96
87	TRUCK	10/10	11/3	REPAIR	97
88	TRUCK	10/10	11/3	REPAIR	98
89	TRUCK	10/10	11/3	REPAIR	99
90	TRUCK	10/10	11/3	REPAIR	100

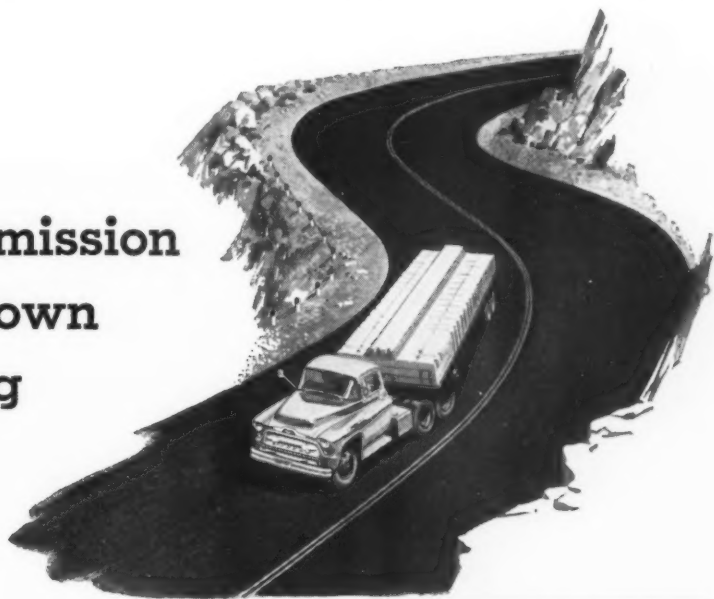
This is a section of the status board on which is posted equipment scheduled for maintenance.

nails, joint paper, flambeaux, and road barricades.

A continuing inventory is maintained in the stockroom, re-orders going out as soon as one part has been taken out of stock. This keeps a sufficient number of parts for one make of equipment on hand at all times so that one part will be available, even if two or more rigs of the same type break down and require the same repair part. This makes it virtually impossible for the stockroom to run out of parts. If re-ordering was delayed until stock on hand reached a predetermined level, there might be a chance that not enough parts of one particular type would be on hand to cover repair requirements.

With its inventory system, and the use of relatively few types of equipment, Seaboard is able to keep its equipment on the line and producing a profit at all times. For the most part, the firm's tractors, graders, and scrapers are Caterpillar units; the 5-yard dump trucks are Fords; draglines are Bucyrus-Eries, and cranes are Limas. Air compressors, also standardized, include Ingersoll-Rand

New 6-speed automatic transmission lets you slow down without touching the brake!



This is just one of the remarkable advantages you get in **Powermatic** . . . a completely new heavy-duty automatic transmission offered exclusively in new Chevrolet Task-Force trucks.

Now Chevrolet brings you exclusive **Powermatic**—the first automatic transmission designed especially for heavy-duty trucks! Unlike conventional or semi-automatic transmissions, **Powermatic** works for you all the time. Six fully automatic forward speeds and a torque converter virtually eliminate manual gear shifting on hills! A revolutionary "retarder" assures safer downhill hauling, far less brake wear. Furthermore,

Powermatic is designed to aid top-notch economy on the highway . . . and you'll make better time through traffic because all shifts are "power-on" shifts!

For all the facts about the biggest improvement in heavy-duty hauling in many years—exclusive **Powermatic**—see your Chevy dealer soon. . . Chevrolet Division of General Motors, Detroit 2, Michigan.



With exclusive **Powermatic Retarder** most hills can be descended without touching the brakes . . . and most normal slowdowns can be made by the Retarder alone!

New Powermatic transmission* is just one of the many ultra-modern features you'll find in the all-new line of Chevrolet heavy-duty trucks! There's a new 195-hp Loadmaster V8 . . . new Triple-Torque Tandem options with G.V.W.'s up to 32,000 lbs., G.C.W.'s up to 50,000 lbs. . . new 5-speed Synchro-Mesh transmission! ** No other big trucks offer so many up-to-the-minute engineering advancements!

*Optional at extra cost in 5000 through 10000 Series models.

**Standard in Series 9-10000 models, optional at extra cost in Series 5000, 6000, 7000, 8000 models.



New Chevrolet Task-Force Trucks

Anything less is an old-fashioned truck!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 441





When actual construction operations taper off, the firm's mechanics keep right on working. Here a Hough Payloader is completely overhauled.

struction superintendents advise him how many units will be required by a job, the type of units needed, and when and where they are to be delivered. Ricketson can get to work on servicing and transporting the machines.

Ricketson, knowing exactly how much time he has available for this work, then assigns mechanics to get the job done. As equipment superintendent, Ricketson is responsible not only for transporting equipment to a project, but also for the maintenance

of equipment being used and the supervision of equipment handling operations.

Since Seaboard operates in an area with a radius of about 150 miles around Brunswick, all projects using a large number of machines have a resident mechanic whose job it is to maintain and repair all equipment at the site. He is authorized to purchase parts from nearby suppliers for minor repairs, but he must telephone the maintenance department in Brunswick for a spare part if the repair job is a big one.

If Brunswick has the needed part in stock, it is delivered to the job by the company-owned Cessna single-engine plane. While an employee of Glynn Concrete Co., a Seaboard affiliate, pilots the plane to the site, the resi-

dent mechanic removes the faulty part from the machine. This shortens downtime for the rig, since the new part can be installed as soon as it arrives. If the repair job is big enough, a mechanic will accompany the pilot to the job site to assist in the work. If the needed part is not in the stock, the plane can stop en route to the project to pick up the replacement.

Resident mechanics use radio-equipped Chevrolet and Ford pickups that carry enough tools for minor repair jobs. The 60-watt base station at the Brunswick office and the General Electric mobile radios in the field are used to good advantage in coordinating work on projects within 50 miles of headquarters.

The mobile sets operate at a frequency of 152.87 megacycles and are installed in pickup trucks used by resident mechanics, passenger cars used by superintendents and supervisors, pickups used by superintendents, and tugboats.

If there is a radio call from a job site for a tire of a specific size, the maintenance shop mounts the tire and delivers it immediately, so that downtime is reduced to a minimum. The damaged tire, rim and all, is brought back to the shop and repaired, then stored for use in future emergencies.

This storing of many completely built-up replacement units is a policy with Seaboard, and one which the company feels has been largely responsible for efficient and smooth-running operations. The built-up spare parts maintained and stocked in the maintenance shop include components of master clutches for D6, D7, and D8 tractors; generators; portable electric generators; and portable steam generators. When a truck motor is in need of a major repair job, it is pulled out of the truck and a spare motor is installed. Replacing an entire motor on a Ford truck takes two men about two and a half hours. The old motor is repaired in the shop, then stored as a replacement. A few completely built-up spare engines are always kept on hand for emergencies.

Field servicing and minor repair work are handled with the Ford service truck, which carries a complete set of greasing reels and equipment for tire repairs. This truck is equipped with three Alemite reels, two for transmission oils and one for chassis lubrication. Three hand pumps supplying diesel oil, truck-motor oil, and tank gas supplement the Alemite reels. The truck also carries an air compressor driven by a Wisconsin engine.

This truck, and the two trucks equipped to supply gasoline and diesel fuel to projects in and around Brunswick, are some of the busiest pieces of equipment owned by Seaboard.

The excellent maintenance procedures used by Seaboard were worked out by H. J. Friedman, the president and general manager of the company, together with the equipment superintendent.

THE END

Thousands of products come from the forests—even beer. African natives make home brew from the fruit of the umganu tree.



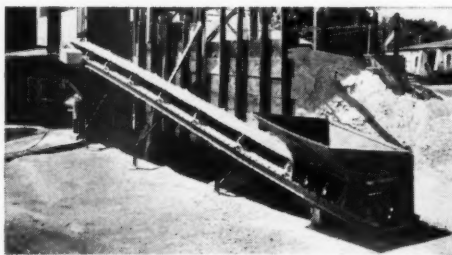
LONG HAUL—Even the longest Barber-Greene Conveyors are built of standardized components . . . produced on a precision, quantity production basis. They can be assembled in almost limitless combinations to cut the time and cost of any material handling job.

Long or short haul—it costs less to move materials with belt conveyors

Thousands of installations—ranging from a few feet to thousands of feet—prove that belt conveyors move bulk material at lowest cost.

No other machine is so simple in construction or requires so little maintenance. No other machine can deliver such high hourly capacities with so little power or attention.

Barber-Greene has given a new meaning to belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner . . . require less engineering . . . are erected faster . . . give top performance . . . and are more easily altered to meet changing or expanding requirements. Being standardized, repair parts are readily available—usually from the stock of your local distributor.



SHORT HAUL—Even the shortest Barber-Greene Conveyors are available in standardized components in the width and length to suit your needs. These small conveyors provide the economical way to handle the widest range of materials with greatest flexibility.

56-7-PE

Send for this 192-page conveyor book. It's comprehensive, easy to use.
Write for Catalog 76-A on your company letterhead.

Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT
For more facts, use Reader-Reply Card opposite page 18 and circle No. 442

INSTRUCTORS INC.
EQUIPMENT
MAINTENANCE
DIVISION



"Emergency brake service!"

Use of fly ash in mix said to improve concrete

■ Substituting a quantity of fly ash for an equal or lesser quantity of cement in a concrete mix results in a concrete that is easier to place; more resistant to water, sulphuric acids, and sulphates; smoother and more uniform in appearance; and less abrasive to equipment and forms, according to the Chicago Fly Ash Co. Tests reportedly have shown that the compressive strength of this mix is equal to or greater than that obtained with straight portland cement.

Fly ash is a finely-divided dry powder collected by precipitators from flue gasses of pulverized-coal-burning power plants. It is comprised largely of spherical-shaped, smooth, glassy particles having a fineness equal to portland cement. It is composed mainly of silica and alumina.

When used in adequate quantities in the mix, the fly ash is said to combine with the free lime resulting from the hydration of cement, converting it so as to form added cementing material. The use of low-cost fly ash in the mix results in substantial economies, the company reports.

For further information write to the Chicago Fly Ash Co., 228 N. La Salle St., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 108.

Tractor maintenance

■ Using the D6, D4, and D2 tractors as examples, a Caterpillar booklet tells the contractor how he can get more production at lower cost from his tractor. Topics discussed are: how to multiply the work power of a tractor; how to put extra speed, convenience, and economy into operations; how to prevent downtime; how to cut operating costs; how to keep machinery "young"; and how to choose the right machine for a job. Job photos or diagrams illustrate each topic. Also listed are attachments for the D6, D4, and D2 tractors. The booklet is also available in Spanish, French, and Portuguese editions.

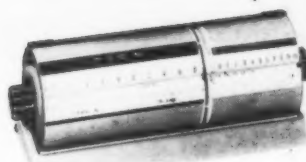
To obtain Form No. 31921 write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 50.

Desk-top calculator shows payroll taxes

■ A mechanical desk-top payroll tax computer which quickly indicates F.I.C.A. and withholding-tax deductions for any number of dependents is available from the Ayres Corp. Interchangeable drums are obtainable for any payroll period, from daily to monthly.

The Ayres Calcular-D speeds calculations by approximately 75 per cent over old methods, according to the manufacturer. Should tax or F.I.C.A. rates change, appropriate drum-charts will be available to replace the obsolete ones. The manufacturer states that new drum charts may be attached in a matter of seconds.

The unit weighs 16 ounces and is 9



With a twist of the dial, F. I. C. A. and withholding deductions are shown on the Ayres Calcular-D payroll tax computer.

inches long and 4 inches high. A plastic cylinder keeps the drum-chart clean, and the reading window is adjustable to individual eye-height preference.

For further information, write to the Ayres Corp., P. O. Box 1081, Wilmington, Calif., or use the Request Card at page 18. Circle No. 64.



Two of the fleet of 28 Euclid 46TD 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions, and operated by Nello L. Teer Company, Durham, North Carolina.

Fuller 10-Speed Transmissions handle Teer's tough hauling assignments

The Nello L. Teer Company of Durham, North Carolina, handles tough hauling assignments with Euclid 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions.

On the boulevard construction job shown above, approximately 3,000,000 yards of dirt and rock were removed to add 80 feet to the present highway along Ohio River bluffs so steep that in many places a triple-bench system was necessary.

Says George Walker, Teer's Master Mechanic: "The heavy-duty Fuller Transmissions paid off in much faster work cycles. We get more work time and less downtime through the right gear ratios provided by Fuller to meet load and grade with shorter, easier shifts."

More equipment owners and users specify Fuller than any other transmission. From the 110 models, semi-automatic and full-manual control,

for trucks from 100 to 400 hp, engines from 330 to 1440 cubic inches, select THE Fuller Transmission designed to do your job better and at less cost . . . ready to help you move more for less. Check with your local truck dealer for the right Fuller Transmission for your job.



FULLER MANUFACTURING COMPANY
TRANSMISSION DIVISION • KALAMAZOO, MICH.

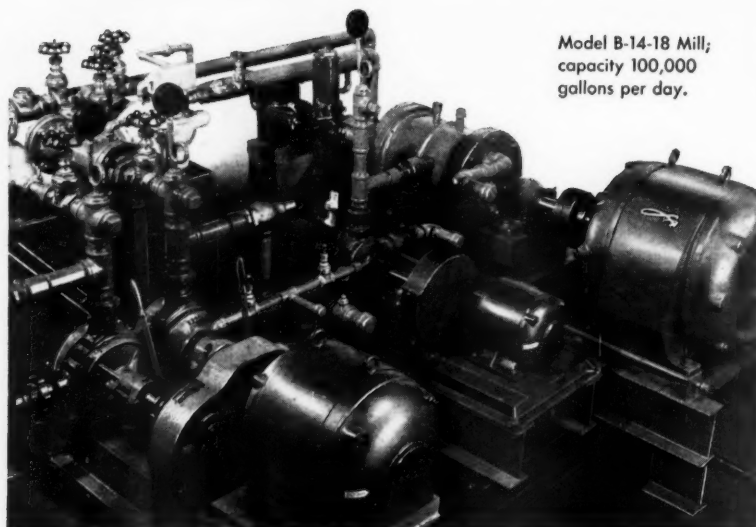
Unit Drop Forge Div., Milwaukee 7, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 443

by R. K. GOULD and E. J. BOWHAY
Research & Technical Department,
The Texas Co., New York, N. Y.

Lubrication — heavy construction equipment

WEATHER-PROOF ASPHALT EMULSIONS FOR BETTER PAVING



Model B-14-18 Mill;
capacity 100,000
gallons per day.

QUALITY-CONTROLLED PRODUCTION through mills of the type illustrated above

Besides producing asphalt emulsions which meet all specifications of A.S.T.M., A.A.S.H.O., Asphalt Institute, and the various state, county, and city public works departments... McConnaughay Licensees manufacture and recommend Weather-Proof Emulsions with these special qualities:

1. *Resistance to water during and after construction.* Weather-Proof Emulsions are not washed off during sudden or prolonged rains occurring immediately after mixing or spreading. Finished pavements are also resistant to water.
2. *Resistance to heat.* Weather-Proof Emulsion Mixtures do not bleed or soften during hot weather. Mixtures of emulsion and aggregate show great strength at 140° F.
3. *Resistance to cold.* Weather-Proof Emulsion Mixtures are tough and resilient instead of brittle at temperatures below freezing.

Complete test procedures and specifications will be mailed upon request. You can always be sure of getting accurate information and fast, dependable service on asphalt emulsions and mixes by calling any of the McConnaughay Licensees listed. Take advantage of this exceptional service. Get in touch with your nearest McConnaughay Licensee or contact...

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1 — Penetration Macadam. 2 — Open-Graded Plant Mix. 3 — Open-Graded Road Mix. 4 — Dense-Graded Plant Mix. 5 — Dense-Graded Road Mix. 6 — Mat Coat. 7 — Seal Coat. 8 — Sand Mix. 9 — Sand Honing. 10 — Patching. 11 — Mastic Mix. 12 — Driveway Construction.

McCONNAUGHAY LICENSEES Operating K. E. McConnaughay Emulsified Asphalt Plants

1. Bituminous Materials Co. Escanaba, Michigan
2. Berkshire Asphalt Co., Inc. 620 Berkshire Ave., Springfield, Mass.
3. James Huggins & Sons, Inc. Medford & Commercial Sts. Malden 48, Massachusetts
4. C. C. Plumb, Elmwood Station P. O. Box 65, Providence 7, R. I.
5. C. C. Plumb Portland, Connecticut
6. Albany Asphalt & Aggregates 75 State St., Albany, New York
7. Knight Paving Products, Inc. 1655 Union Rd., Gardenville, N. Y.
8. Knight Paving Products, Inc. Vine Street, Ithaca, New York
9. Knight Paving Products, Inc. 1980 East Ave., Rochester 10, N. Y.
10. Knight-Bitumen Corp. Watertown, New York
11. Seaco, Incorporated 2700 Industrial Drive, Columbia, S. C.
12. E. A. Mariani—Emulsified Asphalt Hooker's Point, Tampa, Florida
13. Pan-Am Southern Corporation P. O. Box 2, New Orleans 6, La. (Also serving Alabama and Mississippi)
14. Asphalt Products Co., Inc. Powell Ave., Nashville 11, Tenn.
15. Bituminous Materials Co. P. O. Box 267, Terre Haute, Ind.
16. Wabash Valley Asphalt Co. Terre Haute, Indiana
17. Brookman Construction Co. 17th & Gharkey Sts., Muncie, Ind.
18. Fauber Construction Co. Lafayette, Indiana
19. Asphalt Materials & Construction, Inc. 960 E. 22nd, Indianapolis 2, Ind.
20. Ready-Mix Asphalt, Inc. P. O. Box 882, Fort Wayne 6, Ind.
21. Walsh & Ikeler R. R. #2, Gary, Indiana
22. Bituminous Materials Co. 416 S. Water St., Jackson, Mich.
23. Bituminous Materials Co. 318 Atlantic St., Bay City, Mich.
24. Emulsions, Inc. Lawrenceville, Illinois
25. Bituminous Materials & Supply Co. 415 Maple St., West Des Moines, Iowa Plants:
26. Spirit Lake, Iowa
27. Iowa City, Iowa
28. Menlo, Iowa
29. Emulsified Asphalt Co. Kuttawa, Kentucky
30. Doherty and Swearingen Co. 53 Main St., Yarmouth, Maine

Eastern Representative:
John A. Dow
157 Church St., New Haven 10, Conn.

Progress and expansion in the heavy-construction field during recent years have been so rapid as to be almost beyond comprehension. Developments in new equipment and techniques have combined to convert the impossibilities of yesterday into the routine realities of today. Hills can be levelled, solid rock sliced, the course of rivers can be altered. Truly, the whole contour of the earth now can be reshaped by man with unbelievable speed and rapidity to fit his needs of the moment—whether they be superhighways, dams, tunnels, sewers, bridges, factory sites, or new residential areas.

Statistics, dry though they may be, frequently are quite revealing. Those which have been compiled on heavy construction operations reflect well the rate at which activity in this field has expanded since the close of World War II. For example, in highway construction alone, the amounts spent since 1946 on both new projects and maintenance have increased at an average rate of \$300 million and \$100 million per year, respectively. Or, expressed another way, the total expenditure in 1954 for highway construction, including both new operations and maintenance, was 46 per cent greater than that in 1950 and 11 per cent over that for 1953. Actually, in 1954 approximately \$7.6 billion was spent on heavy-construction operations, and conservative forecasts predict that by 1959 this figure will be doubled.

Equipment development

To describe, even sketchily, the recent developments in the equipment which make the current heavy construction operations possible—the tractor and its attachments, the shovel, the dragline, the scraper, the crusher, the grader, the excavator, and the loader, to mention some—would require volumes. However, if one could select a single word which would reflect the trends in equipment design that have prevailed during the past few years, it might very well be increase—increase in engine horsepower, in speed, in unit load and capacity, in mobility and flexibility, in size and ruggedness, in ease of operation, and in features which make for more comfort and less strain on the operator. Full advantage is being taken of all the improvements that have been realized in the power units whether they be gasoline, diesel, or in some cases, lpg engines. Fully automatic or semiautomatic transmissions have been adopted by many equipment manufacturers. Refinements

K. E. McCONNAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT PLANTS AND PROCESSES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 444

A total of 79 Euclids working on a dam project are supplied with lubricants twice daily by a joint-venture team of contractors. Though field servicing takes place under far from ideal conditions, planning can make it effective.



continue to be made in the design of the hydraulically, electrically, or mechanically operated attachments which permit easier and more efficient operation. Thus, on the whole, new equipment tends to be larger and more powerful, which increases the unit work capacity; but at the same time, it is faster, more mobile and much easier to handle, all of which increases over-all operating efficiency.

Costs vs. expenditures

Now to revert to some additional pertinent facts and figures comparing

Operating costs can be reduced to a minimum and equipment life can be extended by:

1. Adopting a simplified lubrication plan which will keep the number of lubricants on the job to a minimum but will still satisfy fully all of the lubrication requirements;

2. Storing and handling lubricants properly so that chances of contamination will be minimized; and

3. Establishing a preventive-maintenance program which includes periodic mechanical and lubricant checkup and following it to the letter.

equipment costs with total heavy construction expenditures. The accumulated evidence shows that the ratio of equipment value to construction value has been increasing steadily over the years. In 1929, the U. S. Bureau of the Census reported this ratio as 19.9 per cent. A Bureau of Public Roads survey indicated that in 1935, for \$100 million spent on highway construction, the value of the major equipment involved was \$47.8 million, an "equipment ratio" of 47.8 per cent. In 1949 a similar survey revealed the ratio to be 67 per cent. In the field of highway maintenance, as separate from new construction, this equipment ratio is even higher. In 1954 the BPR reported that for maintenance operations, a dollar's worth of major equipment was required to perform a dollar's worth of annual maintenance, for a ratio of 100 per cent. These figures emphasize very convincingly the tremendous investment involved in the purchase and ownership of heavy construction equipment.

Idle equipment represents an investment but it doesn't perform any work. It must be operating to be productive, and some very interesting statistics have been developed on the costs of keeping it in service. Of each dollar spent on heavy construction operations, 21.3 cents is equipment

expense (items such as direct operating costs, repairs, and depreciation). Of each dollar of equipment expense, 18.2 cents is for fuel but only 3.3 cents is spent on lubricants, including oils and greases. In other words, 21.3 per

cent of the total heavy construction costs is for equipment expense, but only about 0.7 per cent is spent on lubricants.

Proper lubrication is a must if the equipment is to operate satisfactorily

and efficiently. This is particularly true for today's modern machines with their increased speeds and loads and closer tolerances and clearances. The penalty for lubrication failures

(Continued on next page)

1105...YES, ELEVEN-O-FIVE

is the new-strength wire in Roebling's

Royal Blue
WIRE 1105 ROPE

AS SIZES and constructions go, Royal Blue is like the ropes you have used until now...but the likeness ends there.

Royal Blue is made of Roebling's new 1105 wire, the strongest, toughest wire developed up to now for use in any wire rope.

Royal Blue Wire Rope is as enduring as the wire from which it is made.

Write us for full facts on Royal Blue Wire Rope, or contact your Roebling distributor.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5535 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 445

DIESEL FUEL SPECIFICATIONS

ASTM Diesel Fuels						GMC Detroit Diesel Engine Division			
Grade 1-D	Grade 2-D	Buda	Caterpillar	Cummins		Class A	Class B	Class C	Class D
(See Recommendations Below)									
Gravity, °API		30-35	26 Min.	30-42					
Flash, °F., Min.	100	125	150	100					
Viscosity, SSU @ 100°F.	(32-45)	(34-41)	40 Max.	(34-42)					
Viscosity, Kin. @ 100°F., cs.	1.4 Min.	1.8-5.8	2.5-4.5	2.4-5.0					
Pour, °F.	10°F. Below Use Temp.	0	20 Max.	10°F. Below Use Temp.					
Sulfur, % Max.	0.50	0.5		1.0	0.25	0.50	0.50	0.75	
Carbon Residue, % Max.	0.15	0.20	0.35	0.25					
B.S.&W., % Max.	Trace	Trace	0.10	0.05					
Ash, % Max.	0.01	0.02	0.02	0.01					
Corrosion, Copper Strip	Pass @ 122°F.			Pass @ 212°F.					
Alkali & Min. Acids									
Cetane No., Min.	40	40	46-60	45	45	45	40	40	
Distillation, °F.									
IBP, Min.									
10%, Max.				460					
50%, Max.				675	550	575	625	675	
90%, Max.				725	575	625	675	725	
E.P., Max.	625	675	650						
GMC Truck	Harnischfeger	Hercules	International Harvester	Mack	Murphy	Oliver	Waukesha	Superior	
	(This mfr. specifies ASTM 2-D except for 0.5% Max. sulfur content)		30 Min.	(See Note 2) 32-39 Legal (34-39) 2.5-4.0		(This mfr. specifies ASTM 1-D for year-round use)		30 Min.	
Flash, °F., Min.		115	125		150				
Viscosity, SSU @ 100°F.		(32-98)			34 Min.		30-50	35-50	
Viscosity, Kin. @ 100°F., cs.		2.0-20.0							
Pour, °F.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	10°F. Below Use Temp.	
Sulfur, % Max.	0.5	1.5	0.50	0.50	0.5	0.5	0.70	1.0	
Carbon Residue, % Max.		0.20	0.25	0.20	0.20	0.20	0.50	0.50	
B.S.&W., % Max.		0.05	None	0.05	0.05	0.05	0.10	0.10	
Ash, % Max.		0.02	0.02	0.01	0.01	0.01	0.02	0.02	
Corrosion, Copper Strip			Pass @ 212°F.	Pass @ 212°F.	None				
Alkali & Min. Acids				Neutral	45				
Cetane No., Min.	45	45	40	45			45	35-50	
Distillation, °F.									
IBP, Min.	320		325	320	(98% Recovered at 600-650°F.)				
10%, Max.									
50%, Max.	550		475	475-500					
90%, Max.	600		610-675	675					
E.P., Max.									

NOTES:

¹Caterpillar Specifies "Commercial No. 2 Domestic Furnace Oils".

Specifications Shown Are For ASTM Fuel Oil Grade No. 2.

²ASTM Grade 1-D may be used at sacrifice of performance and economy.

(Continued from preceding page)

can be extremely heavy. When one compares the relatively insignificant cost of the lubricant to the replacement cost of the part to be lubricated

and add to that the down time required to make the necessary repairs, it is certainly "penny wise and pound foolish" to make any compromise with lubricant quality—the risk is too great.

Choice of lubricant

Thus the first step toward proper lubrication is to choose the right product—one which has built into it all of the properties and characteris-

tics required to do the job. However, this is not sufficient in itself. The best lubricants in the world are of no real value until they are applied and applied properly—at the right time and in the right quantity. This involves establishing a definite lubrication schedule and adhering to it strictly.

Through the combination of proper lubrication and a good preventive-maintenance schedule, the costs of keeping equipment in service can be reduced and at the same time the equipment life will be extended. It is hoped that the discussion to follow on lubrication and maintenance will be of some benefit to the operators of construction equipment.

Simplified lubrication plan

In order to meet the demands of industry in general, the petroleum companies have made available hundreds of different types and grades of lubricants represented by thousands of different brand names. From these, the construction machinery manufacturers prepare lubrication charts recommending the various grades or types of lubricants which they feel are best suited for their equipment. However, there has been little progress throughout industry toward standardizing lubrication recommendations. For example, one manufacturer will specify certain grades of lubricants for use on his equipment, while an-

Sooner or Later



CONTRACTORS OPERATING CUMMER PLANTS PRODUCE ASPHALT TO EXACT SPECIFICATIONS . . . AT A PROFIT!

Busy, successful contractors prefer Cumer Asphalt Plants because they are batch-type. With Cumer Batch-Type Plants the mix is perfectly controlled throughout production.

Mr. J. H. Gallagher, President of the Corvallis Sand & Gravel Co., Corvallis, Oregon, owner of the 50-60 ton per hour capacity Cumer Asphalt Plant, shown above, has this to say: "We chose the Cumer Plant for its compactness and simplicity as well as the adequate strength capacity and standard design of all parts. Since each operation meshes in with the next, our Cumer Plant can be efficiently operated with a minimum of manpower."

Operating Cumer equipment is profitable business because Cumer Plants deliver maximum production with minimum downtime, low operating and maintenance costs and consistent quality.

The new illustrated, descriptive Cumer Catalog gives complete specifications of all models of plants, equipment and accessories. Write for your copy today.



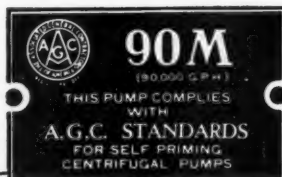
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More water for your money

A.G.C. standards for contractors pumps do more than guarantee pump performance. They progressively call for higher performance as advances in pump and engine design make better performance attainable. 1956 standards, for example, raise the capacity requirement of 15M pumps by 900 gallons per hour. They also call for higher head performance in four sizes of contractors pumps.



Demand this Rating Plate for your protection.

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CONTRACTORS AND ENGINEERS

However, The best no real and ap- time and involves lication strictly, f proper ventive- costs of can be me the ed. It is allow on will be tors of n ds of roleum e hun- ades of usands these, manu- charts des or eel are How- rogress ndard- ations. er will icants le an-

other manufacturer of the same type of equipment with similar basic lubrication requirements may recommend an entirely different set of products. Thus, individually the lubrication charts provided by the equipment manufacturers are usually excellent with respect to lubricant recommendations, but collectively they provide some problems and complications in the field. They are very useful on jobs where there is not a large variety of equipment or where the equipment may be all of one manufacturer. However on jobs where the number and variety of equipment are great, more products would be required than could be handled conveniently if each manufacturer's lubricant recommendations were followed to the letter. For example, a survey of equipment on a small road job revealed that to meet each specific lubricant recommendation would require five grades of motor oil, four grades of gear oil, three grades of gear and cable lubricant, six greases, a track roll lubricant, a cylinder oil, and a hydraulic oil, for a grand total of 21 different products.

Lubrication of construction equipment on the job is usually not performed under ideal conditions even at best. Time is always of the essence and frequently the weather conditions leave much to be desired. In such circumstances, the contractor will be

most reluctant to stock all of the different products required and to insist that his oilers abide by each manufacturer's lubricant recommendation. The personnel responsible for lubricating the equipment know from necessity that the number of lubricants used on the job must be reduced to a minimum. Lacking any other alternative, the contractors themselves or their lubrication engineers must decide upon a consolidated group of lubricants to be used where many have been recommended. Actually this is placing responsibility where it does not belong. What is needed is a carefully designed, simplified lubrication plan worked out in advance so that it will not be necessary to improvise simplification methods hurriedly in the field.

After considerable study of the lubrication requirements of construction equipment, such a simplified plan has been devised. Actual experience on construction work, which has been confirmed by the military, indicates that six basic types of lubricants can satisfy the requirements of nearly all construction machinery. These are shown in the chart along with the parts to be lubricated and interval between applications. The required characteristics of the six lubricants are discussed in the sections that follow.

(Continued on next page)

◀ Simplified lubrication plan for large construction projects

Part requiring lubrication	Interval hours	90-32 degrees F	32-10 degrees F
Gasoline, lpg, and diesel engines (including misc. oiling parts, such as air cleaners, generators, etc.)	100	Heavy duty engine oil SAE-30	SAE 20-20W
Gear boxes	1,000		
Bearing (severe service)	10		
Chain drives	100		
Flexible couplings	1,000	E.P. gear lubricant SAE-140	SAE-90
Universal joints	1,000		
Other oil lubricated parts in heavy duty services	10		
Hydraulic mechanisms			
Air compressors	1,000	Premium grade hydraulic oil SAE-30	SAE-10
Electric motors			
Generators and bearings			
Grease fittings			
Plain bearings	10	General multipurpose grease No. 1 or 0	No. 00
Track rollers			
Hand packed bearings	100		
Wheel bearings	1,000	Wheel bearing grease No. 2	
Roller bearings	100		
Ball bearings	100		
Exposed gears			
Cables	As required	Cable lubricant	
Wire ropes			

Making **TIME** and **PROFIT** Drilling New Haven Tunnel

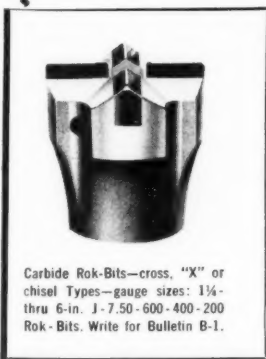


This four-mile, \$2.8 million water tunnel contract is a joint venture of Coker Construction Co. and Peter Kiewit Sons' Co.



Wm. H. Nixon, Project Manager, says: "We've tried them all and we're using Rok-Bits on this job."

COKER-KIEWIT USES ROK-BITS



Carbide Rok-Bits—cross, "X" or chisel Types—gauge sizes: 1 1/4 thru 6-in. J-7.50-600-400-200 Rok-Bits. Write for Bulletin B-1.

Coker-Kiewit crews, under Bill Nixon, with 1 3/4-in. Brunner & Lay Rok-Bit equipped drill jumbo, average 2 1/2 rounds per shift in each of two 9 ft. headings. Working around the clock they tunnel better than 85 ft. in hard granite per day. Each round is drilled with 36 hole pattern. Four-ft. starter steel is used, followed by 8-ft. rods. If you haven't used Brunner & Lay Rok-Bits on a test drill job—do it soon! For full information on this, and other low-cost rock drilling jobs, contact our nearest plant.



Alloy or carbondrill steel.

Brunner & Lay Products

Brunner & Lay, Inc. 9300 King St. Franklin Park, Ill.
Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 East Cumberland St. Philadelphia 25, Pa.
Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.
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FASTER...

Especially designed cutting blade and dies assures fast cutting action. . . . The hammer principle eliminates any special skill requirements.

CLEANER...

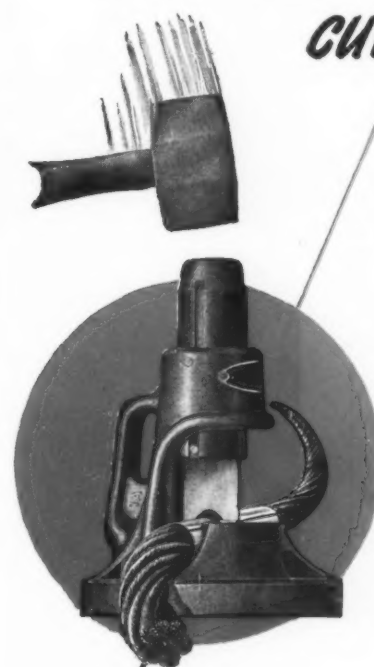
No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

SAFER...

The enclosed cutting blade locked in the body of the cutter assures perfect safety.

and it's PORTABLE..

Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1 1/2 inch.



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Morse-Starrett Products Company
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(Continued from preceding page)

Engine oils

For gasoline engines as well as diesel engines powering construction machinery, it is necessary to use an engine crankcase oil which provides oxidation stability, corrosion resistance, detergent-dispersant characteristics, extreme pressure and antiwear properties, rust protection, and foam prevention. These are the principal characteristics of engine oils generally known as the heavy-duty type.

Industry has come to recognize several different grades or classifications of these heavy-duty-type engine oils. Basically an acceptable heavy-duty oil is generally recognized as an oil which complies with the requirements of Military Specifications MIL-O-2104A. Increased detergent-dispersant properties may be found in those oils which have come to be known as "Supplement I" type oils. Actually there is no established specification covering this type of oil, although the engine test requirements to indicate an oil of this quality level are generally recognized by industry.

Beyond this quality level are the "Series II" oils or "Super-Duty" type oils. These products were developed originally to satisfy the requirements of Caterpillar as "Superior Lubricants (Series II)". More recently Caterpillar has announced a still further advancement in their engine oil requirements designated "Superior Lubricants (Series III)". Oils meeting "Series III" represent about the highest degree of detergency-dispersancy to be found in commercially available lubricating oils for internal combustion engines.

Gear lubricants

Many of the different types of gears, such as the ordinary spur or spiral-bevel where rolling contact occurs between the gear teeth, can be lubricated satisfactorily with a straight mineral oil. However, where there is a sliding contact between the gear teeth faces, as in hypoid or worm gears, the lubricants should be fortified to prevent scoring under heavy loads. These extreme pressure lubricants will also take care of slight misalignments or machining imperfections and frequently are used for breaking in plain gears.

Since a variety of gears is used in construction equipment, a gear oil containing extreme pressure properties is recommended to insure sufficient load-carrying capacity for all types encountered. A good EP gear oil will absorb shock loads in the heaviest drives and still retain its load-carrying properties and will be resistant to oxidation or thickening, corrosion, and foaming.

Hydraulic or compression lubricants

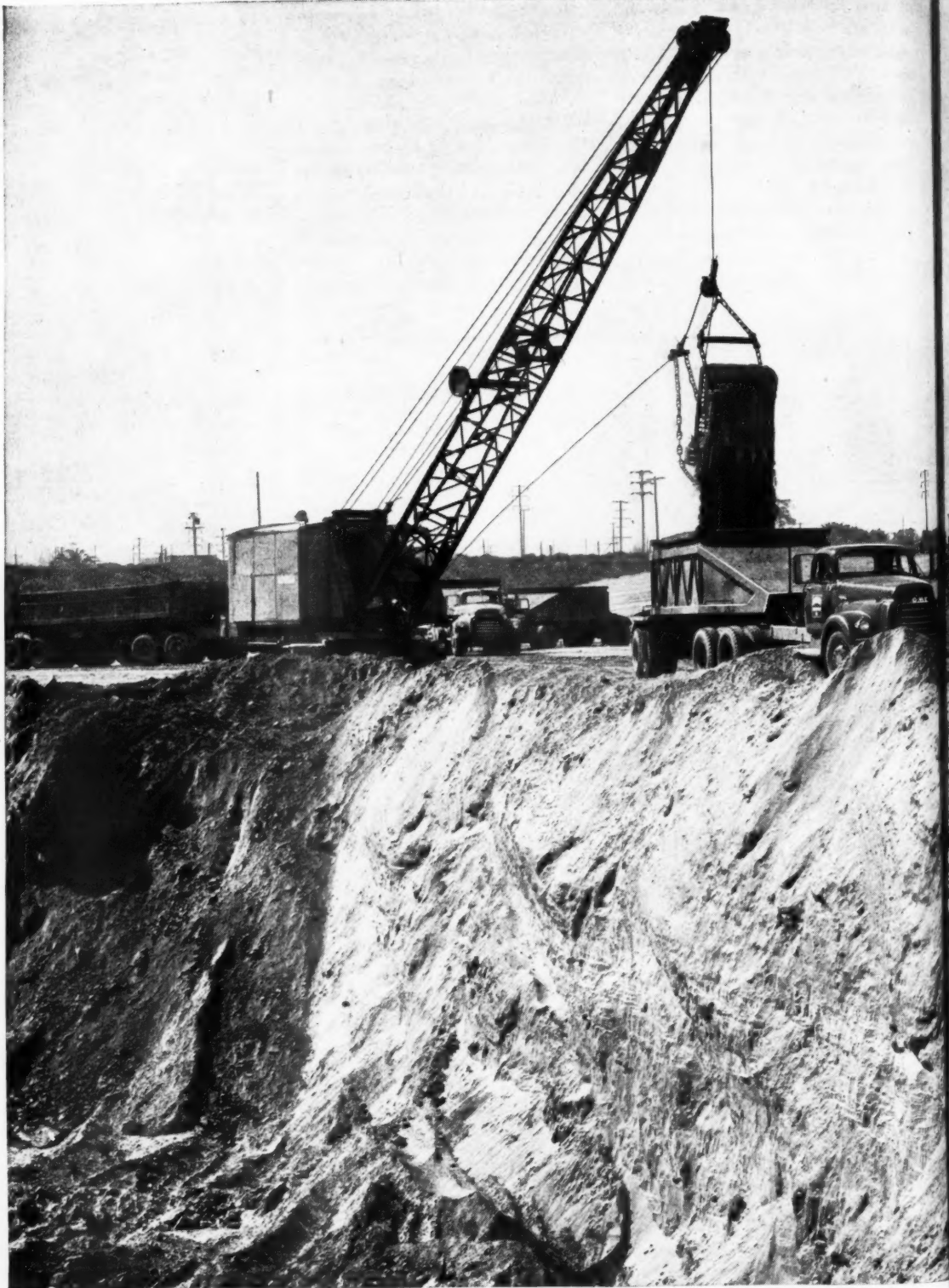
A highly refined straight mineral oil of the proper viscosity has been and can be used satisfactorily for lubricating air compressors, electric motors, generators, bearings, and hydraulic mechanisms.

However, for hydraulic systems in particular there is usually a tremen-

dous advantage in using a premium grade hydraulic oil. These oils have been so compounded as to resist foaming, oxidation, and sludge formation, and at the same time to protect the system against rust and corrosion. Just one or two flakes of rust passing through precision-made pumps or valves may so mar the surface as to affect seriously the efficiency of these parts. Likewise, sludge, as might be formed from oxidation of the oil, can cause sluggish operation of the mechanisms, will increase wear and will eventually reduce clearances, plug lines and valves, and cause the system to become inoperative. Consequently for smooth, trouble-free operation of the hydraulic system, a premium grade oil should be employed, and in line with consolidation



Crushing units like this Cedarapids portable primary double-impeller impact breaker may become caked with dust during a shift. A thorough cleaning should precede lubrication of such equipment.



A TEAM OF 46 GMC'S HAULING SEMI-TRAILER DUMPS are hustling "fill" for this multimillion-ton job. GMC's new Blue Chip heavy-duty line is

engineered to meet any requirement up to 63,000 GVW-90,000 GCW. Model W630's are rated at 65,000 GCW and with 34,000-lb. tandem axles.

of lubricants, use the same product for air compressors, electric motors, generators, and oil lubricated bearings, realizing the benefits of this type oil on this equipment also.

General multipurpose grease

Greases and semifluid lubricants are now available which not only form a tough, durable, long lasting film and cling to the parts to be lubricated, but which also are very water resistant. Such products are especially suited for track rollers and other bearings which are exposed to mud and water. Track rollers in particular require a lubricant which will be sufficiently fluid to flow through bearing passages and still be non-fluid enough to minimize leakage from worn bearings.

Ball and roller bearing lubricant

Wheel bearings and hand-packed ball and roller bearings, such as the clutch release and pilot bearings, require a heavier grease which will provide a tough, adhesive film to cushion against shock and make parts last longer. A good grease for such application will provide ideal film lubrication inside a bearing but at the same time will maintain its original consistency at the outer edges, sealing itself in and keeping out grit and water.

Exposed gears and cable lubricant

Open gears require a lubricant which will cushion load shocks, decrease noise, and reduce wear. It must not channel or throw-off, but should

Working at peak capacity, a Marion power shovel fills a Euclid with a heaping payload. Efficient lubrication plays an important part in keeping these rigs on the line and producing a profit.



"We've delivered 3 million tons of 'fill' to keep a sinking island afloat!"

Here's Asbury Transportation's story on their giant Terminal Island, California, job—and the part played by their 46 GMC trucks.

Terminal Island — Long Beach, California, harbor and site of rich-producing oil wells — has been sinking into the sea at the rate of two and a half feet a year.

Naturally, there's hot competition for the huge job of supplying "fill" to keep this island gold mine "afloat." Asbury Transportation willingly shaded their bid very close to land the contract for supplying three million tons in the past three years. After all, there's an estimated 12 million tons still needed over the next decade.

Forty-four new GMC tandems and 2 four-wheelers were assigned to the job. "We had to be sure of completely dependable equipment to take on one like this," owner Al Eyraud declares.

"Even a few delays and a large part of the profits go out the window."

Actually, the GMC's have done better than expected. Maintenance costs over the three years of hard service have been remarkably low. Rear-end troubles—common in this kind of on-and-off-the-road work—have been nonexistent.

And gas mileage—despite "green" drivers and much hauling through Los Angeles traffic—has been a remarkable 4 miles per gallon.

Yet there's nothing remarkable about Asbury's experience with GMC's. You'll find them—gasoline or Diesel—saving time and cutting costs on many of America's biggest construction jobs. And many of them have the smallest price tags of any truck in their weight class.

Come see for yourself—at your GMC dealer's!

GMC TRUCK & COACH—A General Motors Division



LOADED, WEIGHED AND OUT OF THE PIT IN 3 MINUTES, these GMC's get their crackling pace from GMC's 225-h.p. "503" engine. That's from GMC's great new Blue Chip line of gasoline and Diesel power plants. They team with Safety Power Steering* to ease even the toughest off-the-road work.



WORKING A JOB THAT CALLS FOR 3 MILLION TONS of "fill" in three years, Asbury Transportation's 46 GMC's have chalked up remarkably low operating cost records. And that's typical of GMC owners' experiences — on jobs large and small — the country over!

*Optional at extra cost

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clinging to tooth surfaces and follow through from gear to gear even at high pressures, temperatures, and peripheral speeds.

For cables and wire ropes, the product must penetrate into and preserve the core, preventing collapse. It should seal each wire in a tough, viscous film to reduce internal friction and wear, keep out moisture, prevent corrosion, and extend the rope life.

Lubricants have been developed which have been endowed with the properties necessary to satisfy both of the foregoing requirements. Consequently, if properly selected, a single lubricant may be used for both open gears and wire ropes.

These, then, are the basic properties and characteristics of six types of lubricants which will satisfy most of the main lubrication requirements of heavy construction equipment. This simplified plan is flexible and can be modified and adjusted to meet any given situation. It should be regarded as a guide in assisting operators of construction equipment to reduce their inventory of different kinds of lubricants to a minimum with the assurance that their machines will be lubricated satisfactorily.

Still need for special lubricants

Although the recommendations outlined cover the vast majority of equipment, there may always be certain exceptions or conditions which will necessitate special lubricant recommendations. For example special products may be required for such applications as water pumps (shaft seal type), fifth wheels, electric motors and generators (antifriction), rock drills, steam cylinders, waste packed car journals, brake drum bearings on power shovels (severe service), concrete forms, and rust proofing of equipment in storage.

Also it is not advisable to make a general blanket recommendation for torque converters and hydraulic couplings. Since there are wide variations in lubricant requirements for these components, product recommendations should be made on an individual basis.

Generally speaking, construction equipment manufacturers look very

(Continued on next page)



A maintenance crew lubricates a Caterpillar DW21 in the field. Practically all types of construction machinery can be serviced satisfactorily with only six basic types of lubricant kept in constant supply.

(Continued from preceding page)

favorably on a simplified lubrication plan as evidenced by the following comments.

A diesel engine manufacturer: "Many contractors and users of large quantities of lubricants should profit by such a program."

A manufacturer of generator sets: "We appreciate the advantage of

standardizing on a minimum number of lubricants".

A manufacturer of road-maintenance equipment: "We believe that a simplified and standardized lubrication program has been needed for a long time."

An excavator manufacturer: "We believe that the types and grades of lubricants can be materially reduced so that a contractor will not be required to carry so many different kinds of lubricants to properly service a piece of construction machinery".

A manufacturer of loaders: "We certainly approve such a plan. We believe the fewer lubricants specified, the more likely that the correct one will be used."

A manufacturer of paving equipment: "It is not only a nuisance to the contractor but could be detrimental if a contractor is compelled to handle too many different types of greases and oils".

ON EVERY OFF-THE-ROAD JOB...



GENERAL

**gets the work done
FASTER at LOWEST cost!**

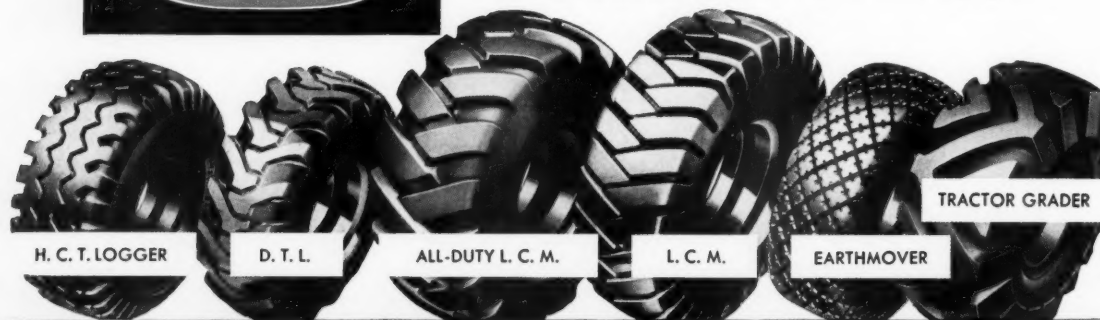
ONLY GENERAL
GIVES YOU
STRONGER-THAN-STEEL
NYGEN® CORD
FOR EXTRA PROFIT
ON THE JOB!



Every hour of every day, in quarries and strip mines, on logging and construction jobs the nation over, The General Tire proves its reputation for toughness, strength and dependability.

Delivering deep-down driving traction and high flotation *plus* Nygen Cord protection against job hazards, The General Tire continues to get the work done faster at lowest cost wherever it operates!

Specify GENERALS on your new equipment



THE GENERAL TIRE & RUBBER COMPANY • Akron, Ohio

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Gasoline fuels

For the gasoline engines powering the various types of equipment with which we are concerned in this article, the regular grades or housebrand gasolines should be entirely satisfactory. Octane ratings of these gasolines are now sufficiently high throughout the country so as to satisfy the octane requirement of even the latest types of equipment for construction service.

Volatility or distillation characteristics of modern gasolines are carefully controlled for quick starting, rapid warm-up, protection against vapor lock, and uniform performance with respect to power and economy. This controlled volatility is maintained not only to satisfy ever changing climatic conditions in a given area but also for any section of our vast country.

Diesel fuels

The majority of the manufacturers of diesel engines used in construction machinery either specify a No. 2 grade of fuel or have established specifications which are usually broad enough to be met by a reputable supplier of diesel fuels of this grade.

As a possible aid in selecting the proper grade of diesel fuel, a table has been prepared showing the diesel fuel specifications of the majority of the diesel engine manufacturers whose engines are used in construction equipment. For comparison, the requirements of the ASTM Grades No. 1-D, and 2-D of diesel fuel are also shown. (Page 106, this issue.)

Storage and handling

The petroleum supplier takes every precaution necessary to assure that lubricants are in the best possible condition when delivered to the customer. The user, likewise, should exercise equal care to see that when a lubricant is applied, it is in the same good condition as when it was received.

All of us know from experience the consequences of eating spoiled or contaminated food—illness, treatment, and doctor bills. Consequently, we

CONTRACTORS AND ENGINEERS

take extreme measures to protect food and be sure that it is in satisfactory condition when we consume it. In a sense, fuels and lubricants are the food of machines. If fed spoiled or contaminated products, they, too, can become ill, and the treatment and "doctor bills" as represented by repairs and new parts can be very costly and expensive.

Many things can happen to a lubricant between the time it is received by the customer and the moment it is applied. Such things as careless handling, contamination, confusion of brands, exposure to extreme temperatures, and leakage can result in damaged equipment, excessive maintenance cost, and lost productive effort. The conditions under which a contractor must store and handle lubri-

cants are particularly hazardous from the standpoint of contamination and exposure to temperature extremes. Consequently, he should be unusually careful to see that nothing detrimental happens to them.

Leakage and contamination

Loss of lubricant from damaged containers, loose fitting plugs, or careless handling (spilling) represents product that the user has purchased but will not be able to use. This all adds up to waste.

All contamination is undesirable and should be avoided, but the extent of the consequences will vary, depending on the type of lubricant and the nature of the contaminants. In general, lubricants containing additives will be affected more adversely than



Lubrication at the right time and in the proper amount is essential if servicing is to be of value. This Euclid bottom-dump gets a complete lubrication job in only a few minutes at a field station.

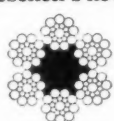
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NEW WIRE ROPE Service-Score SYSTEM

Simple plan tests wire rope performance and costs—shows comparative values—helps reduce operating expenses—speeds reordering.

What is your *true* wire rope cost? Do you know? Are you using the right rope type or construction? The right brand?

Questions like these are readily answered with Leschen's new Wire Rope Service-Score System.



Service-Score stickers report performance—type versus type, brand versus brand. Performance facts reveal costs and help *cut costs*.

Service-Score stickers provide easily-available, helpful reordering data—equipment identification, wire rope diameter, length, construction,

date installed, and date removed.

Service-Score stickers remind operators when it's time to replace rope—*increasing safety margins*.

Service-Score records enable you to check and compare wire rope types and constructions. For example, you find for yourself, as others have, that Red-Strand consistently scores high. You learn the advantages of super-strength Porter Imperial Red-Strand, or Hercules Flattened Strand.

Write for sample stickers. Or see your nearby Leschen Wire Rope distributor.



Leschen's quick-fact-finding Service-Score System utilizes easily applied, easily removed pressure sensitive stickers, which record equipment and rope data, dates of rope installation and removal.

will straight mineral oils. For example, a little moisture will not result in permanent damage to straight mineral oils. They may become cloudy but will clear up after standing as the moisture settles to the bottom. Certain additives, however, may be water sensitive and may be removed partially or completely by contact with just traces of water. Also water will cause separation or lump formation in certain type greases.

Contamination with dirt, dust, or other solid bodies can be especially harmful if not discovered in time. Not only do these materials accelerate oil oxidation and shorten oil life, but also because of their abrasive properties, they can cause severe damage to the moving parts of the machinery.

Thus, extra precautions should be taken to protect lubricants from contamination. At best it can cause extra handling if discovered before the product is used (filtering out solid particles or allowing water to separate). Furthermore, contamination may permanently destroy some of the important properties of certain additive-type lubricants—properties which are essential for satisfactory lubrication of the equipment where the product is to be used. Finally, if the contamination is not detected, some very serious consequences can result, including damaged equipment, costly repairs, and lost production.

Extreme temperatures

Exposure to either abnormally high or low temperatures also can result in temporary or permanent damage to lubricants, depending on the nature and composition of the product. Again, it is the additive-type products which are most subject to harm.

Of the two extremes, contact with low temperatures is by far the more prevalent, due to outdoor storage in areas where the winter weather is very cold. If nothing worse, exposure to low temperatures causes lubricants and greases to become viscous and stiff, making them difficult to handle. Various means are commonly used to heat products which have been subjected to low temperatures, some of which are not to be recommended. Where direct heat is applied, there is always danger of developing local

(Continued on next page)

LESCHEN

Red-Strand WIRE ROPE

Keep the score and you'll use it more—Red-Strand Wire Rope

**LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.**

St. Louis 12, Missouri



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Special care is a must for track rollers. A lubricant non-fluid enough to minimize leakage from worn bearings, but fluid enough to flow through bearing passages, is required.

(Continued from preceding page)

overheating which may ruin the lubricant.

Dispensing

On construction operations in particular, it is most advisable, if at all possible, to apply the lubricant directly from the original container in which it came. The elimination of

intermediate transfer receptacles erases a very serious source of contamination. Dispensing equipment is now available to fit all of the standard containers used to package lubricants and greases. They permit product to be removed from its original container with no danger of contamination, waste, or mess.

Storage suggestions

Some "do's and don'ts" that apply to storage and handling of lubricants are outlined as follows:

1. Choose storage area carefully. Select a central location so that hauling distances are as short as possible. Also select an area where the atmosphere is free from dust and vapors.
2. Store lubricants indoors if possible—chances of contamination will be less.
3. If stored outdoors, drums should be placed on their side and on racks—don't lay them on the ground. When placed upright on end, rain water may accumulate and be sucked into the drum by the normal breathing action. If stored outdoors on end even temporarily, cover should be available to place over drum in the event of inclement weather.
4. Cleanliness is essential regardless of whether storage is indoor or outdoor.
5. Orderliness is another must. By keeping different brands and types of lubricants separated and in their proper places, there is less chance for confusion and error.
6. Don't store more products than necessary. The lubricant supplier will be glad to make a survey of lubrication requirements with a view to keeping the number of different products to a minimum. This also will reduce chances of confusion.
7. Exercise extreme care in heating products that have been exposed to low temperatures. If possible, transfer drums to a warm area and allow product to reach room temperature. If more rapid heating is required, use exhaust steam. Never apply direct heat, such as a flame, to exterior of the drum. This could melt the sealing compound and cause leaking. It might also harm the product.
8. Remember that exposure to temperature extremes can damage lubricants. If there is any reason to suspect that this condition has occurred, examine the lubricant before using. If the product appears abnormal, consult the lubricant supplier as to what to do. The lubricant may have to be discarded or it may be salvaged.

Preventive maintenance

To the contractor striving to complete his job on time, equipment maintenance is (or should be) of prime importance. A piece of machinery which must be pulled off the job for repairs represents lost time. Also equipment not operating at top efficiency can have far reaching effects. For example, a sluggish push tractor may upset the smooth operation of an entire fleet of scrapers, the breakdown of a single haul unit may mean delays to a big loader, and the break-

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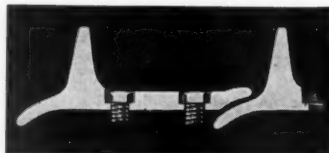
Switch to extra-tough AMSCO® MANGANESE STEEL TRACTOR SHOES

When the going is extra tough, as in rocky areas or abrasive mineral soils . . . tractor shoe replacement can become a major cost item. Both repair time and down time eat up profits.

Switch to "the toughest steel known" . . . Amsco Manganese Steel . . . for tracks and grouser bars. Check their much longer service life against the moderate extra cost. Add to this the greater

efficiency and pulling power of your tractor, over a longer period of time. The answer: *important operating economies.*

Amsco Manganese Steel gives excellent resistance to abrasion accompanied by impact . . . actually *work-hardens* in use. Write for full information on long-wearing Amsco Manganese Steel Tractor Shoes—the economical answer to high track-replacement costs.



COUNTER-SUNK BOLT HOLES

Amsco Track Shoes have holes counter-sunk for less wear on bolts. Saves cost of replacing bolts when changing shoes.



AMSCO

American Manganese Steel Division • Chicago Heights, Ill.
OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC
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down of a loader—even for a short time—may delay a long series of operations.

Although the lesson has been learned the hard way, experience has proven that in the long run it pays to take care of equipment on the job and not neglect it. A program of preventive maintenance, well planned and properly executed, will pay for itself over and over again. For example, it is much cheaper to keep a bearing adjusted than it is to buy new bearings, shafts, and gears that become damaged when unadjusted bearings fail. Major breakdowns, lost time, and high operating costs can be kept to a minimum by keeping parts lubricated, tightened, and adjusted. Furthermore an operator whose equipment is always in good condition is very apt to be a happy, satisfied employee.

Since no two jobs are exactly identical, the actual details and execution of preventive-maintenance programs will necessarily vary from job to job. However, there are a few basic concepts which are common and essential to all successful programs:

1. Set up a definite schedule for lubrication and mechanical check-ups and stick to it strictly. Any program will begin to fall apart and become ineffective once exceptions are made and one starts to "cheat" on the original schedule. For example, if it is found that the interval between lubricant changes can be increased a certain amount with no apparent adverse effect, the natural tendency then is to extend it further and further. Such practice will inevitably lead to disaster.

2. If possible, have the preventive maintenance work performed on an off-shift, as this will cause a minimum of downtime.

3. Assign men to this job who are familiar with lubricants and who are thoroughly acquainted with the equipment. The consequences are too great to entrust this work to uninformed personnel.

4. Keep accurate records of the servicing done on each piece of equipment. This need not be a complicated procedure. A few simple check marks on a printed form are all that is required. A study of such records will usually serve as a warning of possible trouble. For example, excessive oil consumption is evidence of poor lube fittings or oil leaks—items which can be checked at once by the mechanic. Also these records will indicate when the machine should be overhauled.

5. Keep on hand a stock of parts and expendable supplies—if they are available when needed, equipment requiring new parts will be out of service for a minimum amount of time.

6. Clean equipment before servicing. On the face of it, this may seem ridiculous since the machines will become dirty again as soon as they are put back in service. However, there are two good reasons for following this practice. First, the lubrication fittings will be uncovered, and the chances of any points being missed will be reduced. Fittings caked over with mud may be overlooked in accordance with the old adage "out of

sight, out of mind". Second, there is less chance of dirt from the machine contaminating the lubricant at the moment of application.

These, then, are some points that should apply to any good preventive-maintenance program. As mentioned earlier, the actual details of carrying out such a program must be worked out for each individual job. Usually, it is more difficult to set up an ideal program on short term jobs than on those that last for an extended period. As far as lubrication is concerned, the critical points are those which must be lubricated frequently and the critical time is at the start of the job.

Service suggestions

Some useful service hints on various parts of construction equipment are

outlined as follows:

AIR COMPRESSORS:

Keep valves clean to avoid excessive discharge temperatures and keep receivers drained of any accumulated oil. Service air cleaners every 5 to 10 hours, if necessary.

BALL AND ROLLER BEARINGS:

Ball and roller bearings often have seals to prevent grease leakage. If seals are in good condition, a grease charge should last about 200 hours. Use a low pressure gun and apply only a few shots unless bearing is vented. Forcing grease around the shaft will break the seals. Fill bearing between a quarter and half full.

BRAKES:

Do not over-lubricate wheel bearings as excessive lubricant may reach the brakes. Since hydraulic brake

mechanisms often contain rubber parts, use only approved fluids which will not affect them.

CABLES AND WIRE ROPES:

Do not lubricate cables that drag in the dirt. Cable winding on drums equipped with clutches should be lubricated sparingly to prevent the possibility of lubricant reaching clutch faces.

Other cables should be cleaned every 10 to 100 hours, as necessary, to avoid dryness, and cable lubricant applied.

About every 500 hours, cables should be immersed for a minute or two in heated cable lubricant using a trough built especially for this purpose. Usually this is a horizontal trough equipped with pulleys ar-

(Continued on next page)



Contractors praise performance of new portable earth tamping machine

... and it's no wonder! Travelling 15 to 45 feet per minute, the self-propelled JAY TAMPER delivers more than twenty-two hundred 1800-lb. impacts per minute. That's applying more pressure per square inch than a ten-ton roller. And that's making easy, smooth, fast and efficient work of the toughest tamping jobs ... all the time it's saving you money.

Contractors tell us the JAY TAMPER is the long-awaited answer to many of their tamping tasks ... like tamping right smack next to abutments, properly keyseating (to uniform proctor densities, too), after any type of backfill ... and hosts of other applications.

Why not write, right now, for a demonstration of the Jay Tamper and how it can save you money on your job—large or small.

Check these features:

- One man will easily outwork a 5-man air compressor crew
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The **JAY** Corporation 177 HOSACK STREET, COLUMBUS 7, OHIO

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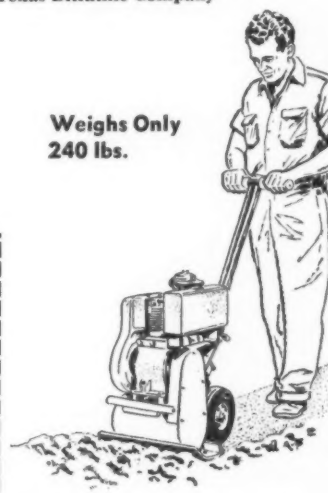
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240 lbs.



(Continued from preceding page)

ranged to keep the cable submerged while it is run through. A burlap collar wipes off excess lubricant before the cable leaves the trough.

CHAINS:

In order to lubricate the pins of silent chains, remove chains every fifty hours, wash in diesel fuel or kerosene and soak in hot gear oil.

CLUTCHES:

Use low pressure gun and do not over-lubricate clutch parts. Lubricant on clutch facings will cause slipping.

ELECTRIC MOTORS:

Inspect grease-lubricated bearings every 2,000 hours. If grease has deteriorated or if dirt is present, clean and repack and add grease to housing until one-third full. Add a small



A Sierra loader and Caterpillar tractor work on a grading project. Frequent lubrication keeps dirt and water from working into track rollers.

amount of grease every 1,000 hours but do not over-lubricate.

Check oil level of oil-lubricated bearings regularly. Wash out bearings every 2,000 hours. Do not flood bearings, and wipe off any excess oil.

Engines (Gasoline and Diesel)

CRANKCASE:

The drain period recommended by the engine manufacturer covers normal operation. More frequent draining is necessary if oil temperatures are above normal, if engines are started and stopped often, or idled for long periods, if the atmosphere is very dusty, or if the oil has been diluted to facilitate starting. Generally, oil should be drained from engines of construction machinery at 50-hour intervals. Where operating conditions are not too severe, 100-hour drain periods are entirely practical. On the other hand, if the filter or oil shows excessive contamination, filter cleaning and oil drain periods should be shortened. Extending the oil drain period is poor economy, since additional wear and deposits due to greater oil contamination will cause greater maintenance and shorter equipment life. Copper or white metal specks on the filter often serve as warning of incipient bearing difficulties.

Drain oil while hot—this is a must! If the oil filter is removed when draining oil, add an extra quantity when refilling the crankcase. Check the oil level every 10 hours, after the engine has been stopped for a few minutes to allow oil in the upper part of the engine to return to the case. When changing brands of oil, even when manufactured by the same supplier, it is advisable to drain the crankcase at the end of the first 24 hours of operation to remove old oil deposits loosened by the new oil.

Crankcase ventilator air cleaners should be serviced when oil is drained.

AIR CLEANERS:

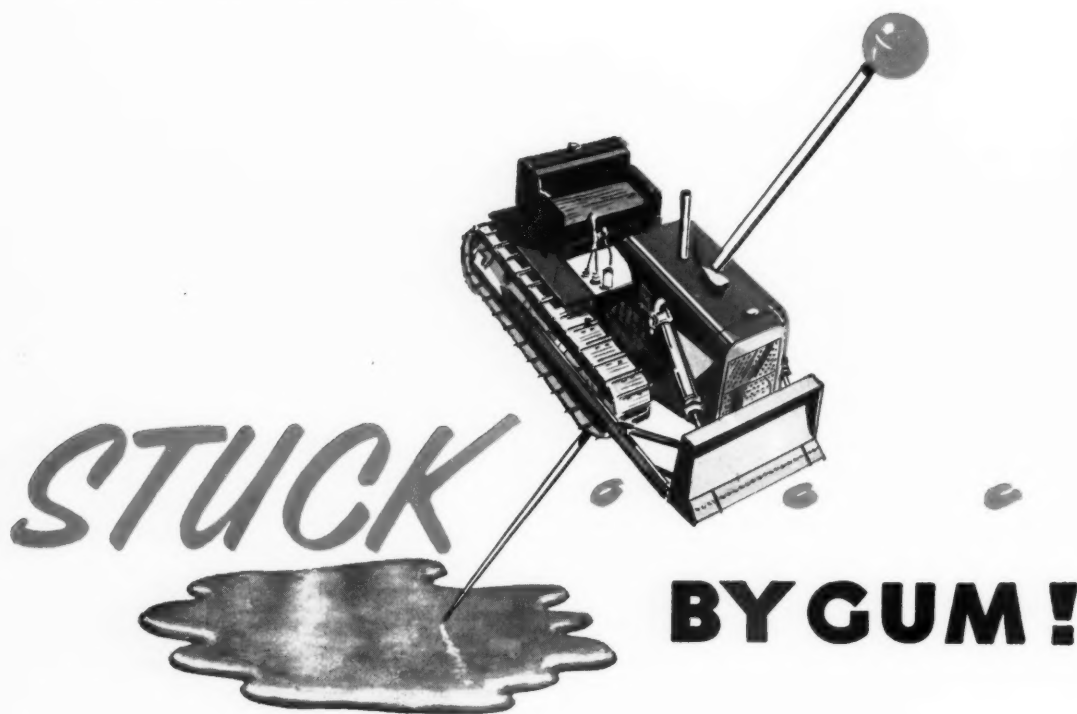
Air cleaners may be of the wire gauze type in which the gauze is either replaced with a new element or washed in kerosene or diesel fuel, dipped in oil, and reused. Usually any heavy oil (SAE 50) is satisfactory for coating the oil-wetted type.

The oil-bath-type cleaner requires inspection at 5 to 50-hour intervals to keep the oil at the proper level and the oil cup clean. Stick a screwdriver down into the oil, and if the sediment is $\frac{1}{4}$ to $\frac{1}{2}$ -inch deep, the unit should be cleaned and refilled. The entire assembly should be taken apart and cleaned every 500 hours. Carryover of oil into the intake manifold indicates that the engine has been over-speeded, the oil is too light, or the air cleaner is too small. Do not remove the oil cup when the engine is running.

Centrifugal precleaners should be emptied when the glass container becomes half full.

COOLING SYSTEM:

To insure complete combustion and to avoid contaminating the lubricating oil with fuel soot, engine cooling systems should be maintained at about 180 degrees F. This requires the use of shutters or other covering over



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for both Fuel and Lube Oil applications and for Full-Flow and By-Pass systems. There are WIX Cartridges designed especially for

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Your operating costs go up fast when your construction equipment is pinned down—on the job or in the shop—by clogged fuel injectors, scored cylinders and worn bearings. The common cause of these troubles is the grit, dirt and gummy sludge picked up by fuel and lube oil under rugged, construction service conditions. The thrifty cure . . . prevention . . . is WIX Engineered Filtration.

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the radiator when starting up or operating at light load in cold weather. In hot weather special attention should be paid to the fan belt, radiator, and water jacket to maintain the cooling system at maximum efficiency. Thermostats must be checked frequently by noting whether the radiator remains cold until the engine has reached proper operating temperature as shown by the indicator on the dash.

Permanent type anti-freeze solutions are preferred for construction machinery engines since alcohol boils at about 170 degrees F and most cooling system thermostats are set above this figure for efficient combustion of the fuel. Kerosene and salt solutions should never be used.

DISTRIBUTORS:

The lower part of the distributor often is lubricated automatically from the engine. When driven from the generator, however, separate grease lubrication is usually required.

The upper distributor bearing may require either grease or oil lubrication. The wick under the distributor rotor requires two or three drops of light oil. An occasional touch of grease to the cam shaft is desirable, making sure, however that none reaches the breaker points.

FANS:

Fans mounted on the extension of the shafts of other engine accessories and having no separate bearings require no lubrication; neither do those having permanently packed bearings.

Some fans require occasional grease application, while others must be lubricated regularly with oil. One type of oil-lubricated fan is equipped with an overflow while another is provided with a standpipe to insure constant oil level. In the latter type, the reservoir is filled with oil and the excess drained by turning the fan until the filler hole is down. If over-lubricated, fans may throw grease or oil on the belts.

GENERATORS:

Over-lubrication causes deterioration of windings and gum formation on the commutator.

OIL FILTERS:

Clean or replace filter element at every oil change or more often under severe dirt conditions. Low-temperature operation requires more frequent filter changing due to condensation forming an emulsion with the oil.

Oil filters do not remove fuel dilution or soluble oxidation products. Therefore, crankcase oil must be changed regularly regardless of the filter type. Bypass filters do not remove all of the finely dispersed soot. Consequently, where these filters are used, detergent oils may turn dark quickly in service. This is a sign that they are functioning properly.

WATER PUMP:

Some require no lubrication since they are lubricated either automatically from the engine or permanently packed at the factory.

Others have a wick leading from an oil sump and some have porous bushings through which oil seeps to the bearings.

Grease lubricated pumps in which the grease does not come in contact with the engine coolant (i.e., when the

grease is applied to an external support bearing) should be lubricated with a general-purpose grease. Those in which the grease does come in contact with the engine coolant (i.e. when the grease is used to lubricate the packing seal) should be lubricated with a heavy-water-insoluble grease.

If cooling systems show signs of oil, it is an indication that either too much or the wrong kind of grease is being applied to the shaft.

GEARS—ENCLOSED:

In most cases the oil need not be changed more often than every 1,000 hours, although the oil level in the gear boxes should be checked every 50 hours. Check the drain plugs after heavy rain or severe dust conditions, then drain and refill if water is present or if dust is getting in. Keep the

oil seals in good condition to prevent leakage. Going to a heavier grade of lubricant does not necessarily reduce leakage, since under heavy loads the heavier oil will result in an increase in the gear-case temperature which, in turn, will cause the lubricant to become less viscous. Foaming or overheating in gear boxes often indicates too high an oil level. This will also cause leakage. Keep vents open to prevent pressure build-up inside the gear case.

GEARS—OPEN:

Lubricants for open gears may be one of two types—those which must be heated and applied by brush or pouring or those which contain a solvent and are fluid at normal temperatures, thus permitting easy application. Shortly after application the sol-

vent evaporates, leaving a thick viscous film of lubricant.

Gears should be inspected every 10 hours and more lubricant applied if necessary. Open gears operating in very dusty locations should be washed frequently with crankcase oil and no other lubricant applied. If gears must be run dry, reduce speeds and loads.

GREASE FITTINGS:

Wipe fittings before and after applying grease. When the plug must be removed and a fitting applied, it is an indication that this part should be lubricated only occasionally. Most parts, such as plain bearings, should be lubricated frequently and freely by applying product until clean grease shows at the point where the old grease is forced out.

(Concluded on next page)

New SUPERIOR Heavy-Duty SCREED SUPPORTS

Pat. Applied For

For Use with 1 1/4" and 1 1/2" I.D. Pipe Screeds and Vibratory Screeding Equipment



ADJUSTABLE SCREED HOLDER

Consists of a 1" threaded rod to which is welded a cradle to hold the pipe screed. This cradle is slotted as shown so that the arms may be bent over to secure the 1 1/4" or 1 1/2" I.D. pipe screed. Threaded onto the rods is a half nut which provides the adjustment.

Especially Designed for Use on Bridges, Underpasses and Overpasses

These Screed Supports are designed to take the heavy loads imposed by traveling vibrating screeding equipment. The Bases for the screed holders are of two types: (1) The Metal Base for use on structural steel members; (2) the Chair-Type Base for use on a plywood deck.

On Structural Steel: As shown above, the Metal Base is tack-welded to the top flange on approximately four foot centers. The Screed Holder is set into the base, and adjusted to height by turning the nut. The threads are fast, three to the inch, and of a contour type, non-clogging and easily cleaned.

On Wood or Plywood Decks: The Chair Base is set on the deck at approximately four foot centers. It is easily secured to the deck by nailing across the upturned legs. If desired, legs can be supplied of galvanized wire. The Chair Base with holder is shown below.

PERFORMANCE

Superior's Heavy-Duty Adjustable Screed Supports have been used on turn-pike structures and other projects. Results in the field indicate that this method of supporting screeds provides a simple answer to an otherwise expensive and complicated set up. Write for Bulletin.

HOLDER INSERTED IN CHAIR BASE

Only the inexpensive bases are left in the concrete. The Adjustable Holders are easily removed, together with the pipe screed, because the holders are set, not screwed into the base. The nut fully covers the base opening and prevents concrete from entering.



Adjustable Standard SUPERIOR SCREED CHAIRS

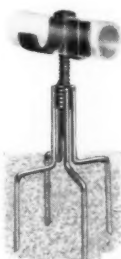
FOR FORMED SLABS 4 1/2" AND GREATER

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.



FOR SLABS ON FILL

With re-usable screed holders using 1" I.D. pipe and rectangular bars for screeds.



SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office

Pacific Coast Plant

1775 Broadway, New York 19, N. Y.

2100 Williams St., San Leandro, Calif.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 456

(Continued from preceding page.)

HYDRAULIC SYSTEMS:

The pumps and valves of hydraulic systems are precision made, and a premium grade, inhibited oil should be used which will protect parts against wear, rust, and corrosion and which will have high resistance to foaming and the formation of gum and sludge. Gum and sludge formation may result in erratic motion and may eventually plug up the system.

Check the oil level frequently and keep it constant. This will prevent air from being drawn into system which could cause foaming. If foaming occurs or if the oil level is low, check the system for leaks.

POWER CONTROL UNIT:

Operate the clutch firmly to pre-

vent slippage which results in overheating, hardening of leather oil seals, and leakage.

RUBBER PARTS:

Oils and greases may cause natural and some synthetic rubbers to deteriorate. Keep tires, fan belt, rubber hose, engine mountings, rubber bushings on radius rods and spring shackles, and cooling-system connections free from fuel, oil and grease.

Use only approved fluids in shock absorbers, brake cylinders, and hydraulic control systems containing rubber diaphragms, plungers, or seals.

STEERING GEAR:

Keep gear housing filled with recommended oil to lubricate gear surfaces, bearings, and steering shaft. Use a low-pressure pump to prevent lubricant from being forced up the

steering column.

TRACK ROLLERS:

Track rollers of crawler mechanisms having plain bearings require frequent lubrication to prevent dirt and water from working in. Those on shovels, draglines, and cranes should be lubricated every hour when traveling.

TREADS—CATERPILLAR TYPE:

Do not lubricate. This refers to treads only and should not be confused with the track roller or idler assemblies. The pin between individual treads is designed to operate without lubrication as dirt or other abrasives which could be picked up by the oil would act as a lapping compound and shorten the life of the track.

TURNTABLE ROLLER PATH:

Do not lubricate (except double-

flange type with hook rollers). Lubricant will cause rollers to slide and wear flat. Lubricate bearings of turntable rollers sparingly to avoid drip on paths.

UNIVERSAL JOINTS:

Some universal joints are provided with lubrication fittings. The ball and trunnion type should not be over-lubricated as the boot will become filled with lubricant. Some roller bearing types require disassembly and hand packing by a qualified and experienced mechanic.

The propeller shaft splines usually are equipped with a fitting. The type of plug or fitting should not be changed as the balance of the rotating part would be affected.

WHEEL BEARINGS:

Front wheel bearings generally are lubricated by removing the wheels and repacking by hand.

Some rear wheel bearings have to be removed, while others are lubricated automatically from the differential or are permanently packed at the factory. Some are equipped with a grease cup or fitting, and still others have a plug which must be removed and a fitting substituted, the plug being replaced after the lubricant has been applied.

Premature failure often is caused by contamination with dirt and dust during cleaning and repacking. Whenever wheel bearings are removed, they should be examined, washed carefully, and dried with air. After cleaning, grease should be packed around the bearings and the bearings replaced. Grease seals should be examined carefully and replaced if necessary. Ball bearings must be adjusted so that the wheel will turn freely with no end play. Only a small amount of additional grease should be placed in the bearing housing as over-lubrication may result in grease on the brakes.

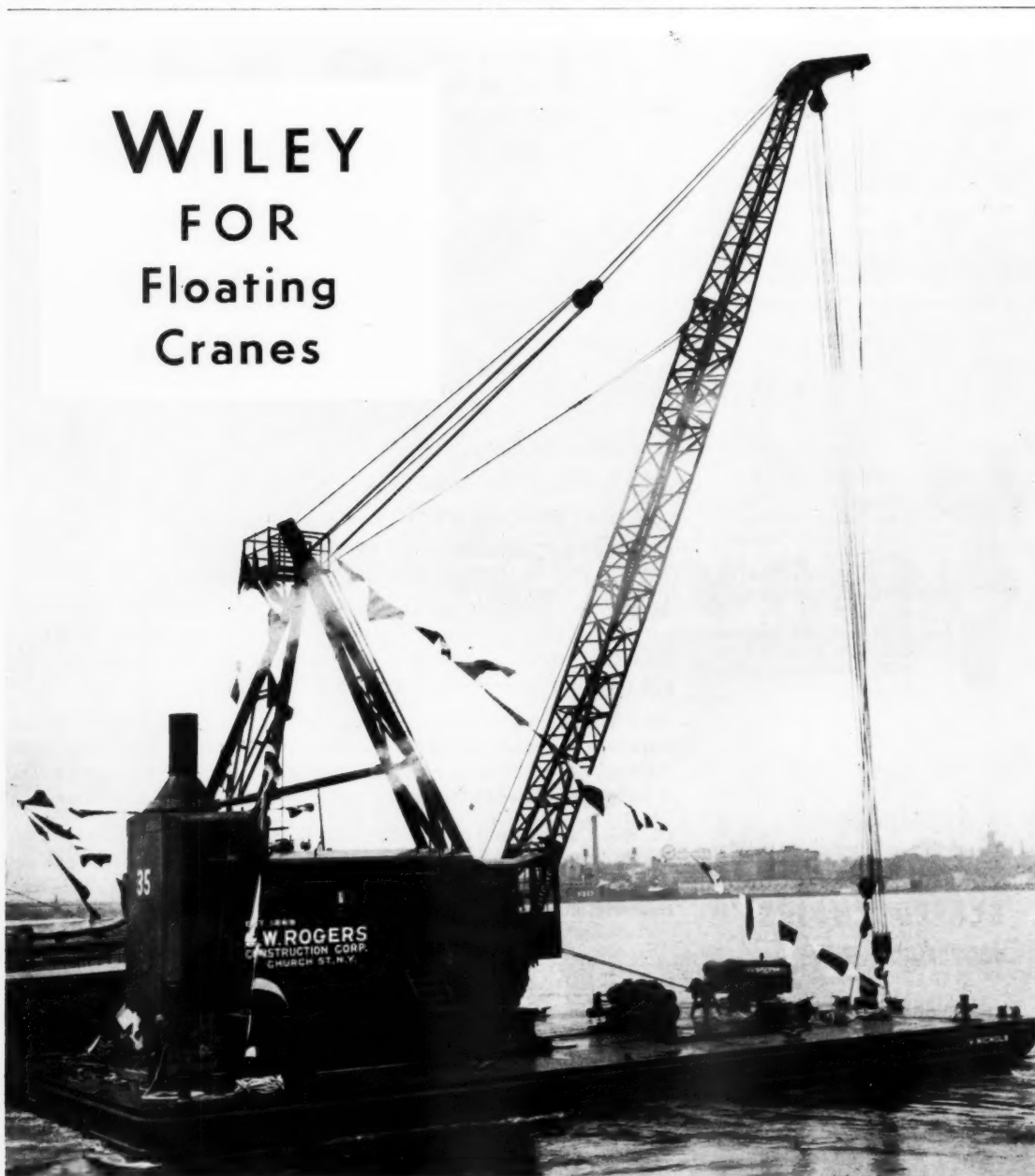
Summary

Investments in heavy construction equipment and expenditures for construction projects are at an all-time high and are expected to increase still further during the next few years. Over 20 per cent of the total sum spent on construction operations is devoted to keeping equipment operating, but less than 1 per cent of the total is spent on lubricants. In view of the recognized importance of proper lubrication to the performance and life of the machinery and the relatively low amount spent for lubricants, it is self-evident that compromising with lubricant quality is false economy.

Operating costs can be reduced to a minimum and equipment life can be extended by: (1) adopting a simplified lubrication plan which will keep the number of lubricants on the job to a minimum but will still satisfy fully all of the lubrication requirements; (2) storing and handling lubricants properly so that chances of contamination will be minimized; and (3) establishing a preventive maintenance program which includes periodic mechanical and lubricant check-up and following it to the letter.

THE END

CONTRACTORS AND ENGINEERS



One of three Wileys Floating Cranes owned and operated by the George Rogers Construction Corporation for harbor and pier maintenance work in the New York Harbor.

WILEY

MANUFACTURING COMPANY

BARIIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND

PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 457

Case history

Pipe detector saves utility repair costs

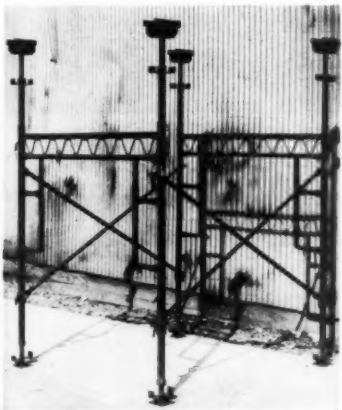
A California drilling contractor, now using electronic pipe detectors, estimated that he is saving more than \$6,000 a year in the cost for repairing and replacing pipes and utility services formerly torn out by his equipment. Another drilling contractor purchased several electronic detectors immediately after one of his bulldozers cut the main power supply cable to a large veterans' hospital in California's San Fernando Valley.

By means of the detector, contractors can accurately locate underground installations which they either wish to expose or want to leave intact. Such accidents as broken water mains or gas explosions can be prevented when the machine operator knows just where these lines are located. By the same token, lines scheduled for repair or replacement can be found quickly and excavation costs thereby reduced.

For more information on electronic pipe detectors write to the Computer-Measurements Corp., 5457 Cleon Ave., North Hollywood, Calif., or use the Request Card at page 18. Circle No. 194.

Scaffold frame doubles as concrete form support

■ Tubular-sectional scaffolding described as incorporating an entirely new idea in this type of equipment is offered by Concrete Forms Corp. A



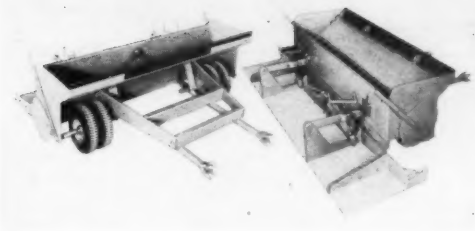
Do-All scaffolding has telescoping extension legs which permit its use as a concrete form support.

feature of the Do-All frame is that it will serve both as regular scaffolding and a support for concrete slab or beam forms.

The Do-All model has oversize legs which accommodate telescoping extensions for erecting walk-through scaffolding or form supports.

Quick-Lock hook-on braces, wedge-shaped brace ends, and other components of Time-Saver scaffolding are said to provide greater stability, hence safety, and to permit speedier erection. Rolling towers, ladder frames, and other types of scaffolding are also offered by the company.

For further information write to Concrete Forms Corp., 314 Hooker Road, Chattanooga 9, Tenn., or use the Request Card at page 18. Circle No. 168.



The new Miller spreader for asphalt and aggregate features a device which permits the laying of crowns and reverse crowns up to 2½-inches thick.

Towed spreader features adjustable crown device

■ A crown device built into the floating screed and permitting formation of crowns and reverse crowns up to 2½ inches thick is one of the features

of the modernized towed asphalt and aggregate spreader manufactured by the Miller Spreader Corp. The crown device is standard on all new models.

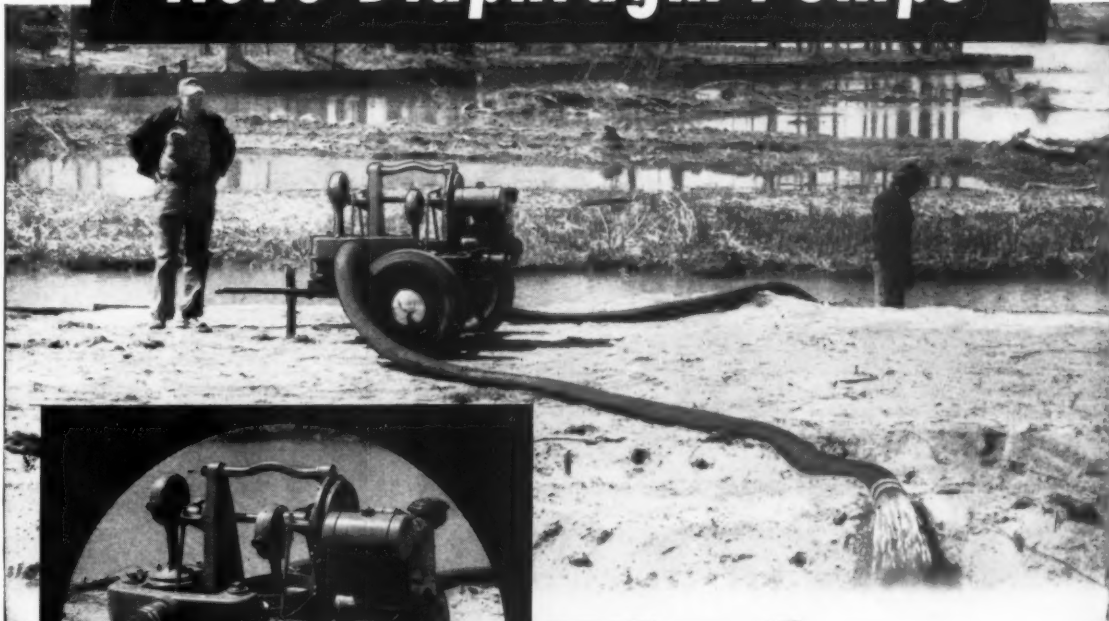
The floating screed of the Miller spreader moves forward on an even plane no matter how irregular the base surface may be, the manufacturer reports. This permits the laying of a smooth, level strip ready for rolling. The floating screed is fabricated of ¼-inch steel plate.

Miller spreaders are available in widths of 8, 9, and 10 inches. The screeds can be widened by means of 12-inch screed-extension plates. When used with open bleeder plates, the extensions smooth and level all extra material without leaving seams and ridges.

For further information write to the Miller Spreader Corp., 4020 Simon Road, Youngstown 2, Ohio, or use the Request Card at page 18. Circle No. 147.

DEPENDABLE!

Novo Diaphragm Pumps



Sandusky Development Corp. building 250 exclusive homes on Cedar Point Chausee, overlooking beautiful Sandusky Bay at Cedar Point, Ohio, find Novo Diaphragm Pumps meet their most exacting requirements for heavy-duty pumping operations on the job.

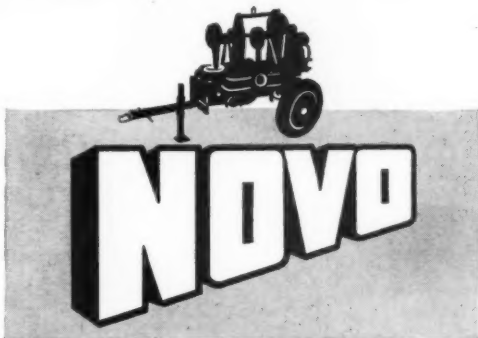
NOVO Diaphragm Pumps are the contractor's foolproof dependable "work horses"—no other type pump can take its place:

- Require no attention while operating
- Noted for ease of clean-out
- Operates while handling water with high air percentage
- Handles water laden with debris and abrasives without damaging pump
- Sand, sludge, mucky water and large obstacles can pass through a NOVO diaphragm pump
- Stays on the job under the most rugged operational conditions
- NOVO exclusive "Tripl-Life" diaphragms outlast all others four to one

There is a full line of famous NOVO pumps now available for every purpose. Write for the name of your nearest distributor or dealer.

NOTE: There are a few dealership territories available, write for information.

Illustration shows NOVO 4 inch Double Diaphragm pump mounted on high speed, independently sprung trailer... this unit equipped with electric self-starter and generator. NOVO also manufactures 3 and 4 inch Single and Double Diaphragm models with capacities of from 4,000 to 16,000 GPH.



NOVO PUMP AND ENGINE COMPANY

Another Universal Affiliate

702 Porter Street

Lansing 5, Michigan

Other Universal Affiliates: Universal Gear Div. • Bradford Machine Tool Co. • Brown Industries, Inc. • Sani-Septic Systems, Inc.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 458

Case history

Pipe driven at 1/7 cost of open trench-method

Replacement of a 2-inch branch gas main across a 60-foot-wide thoroughfare at an intersection in Delaware was handled at an estimated 1/7 of the cost of open trenching when the Delaware Power and Light Co. used pipe-driving tools developed by the Gas Distribution Department of the Delaware Tool Steel Corp. to do the job. Under adverse weather conditions, the cost of using the open-cut method would have been even greater.

The complete drive of 80 feet took 3 hours, only half of which was actual driving time. The balance was spent in setting up pipe for the drive, weld-



Four men, a compressor, and tools manufactured by the Delaware Tool Steel Corp. drove 80 feet of 2-inch pipe, in two 40-foot lengths, under this main thoroughfare in Delaware in 90 minutes of actual driving time.

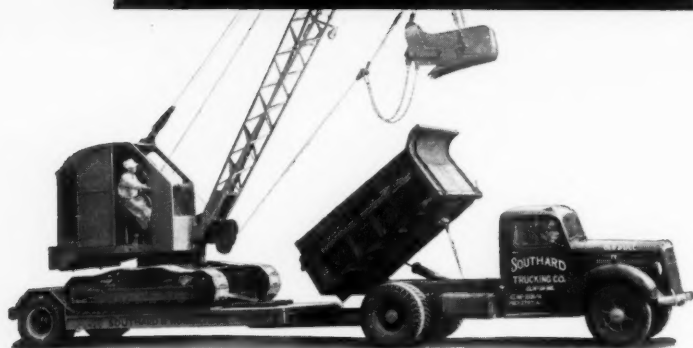
ing a second length of pipe in the ditch, testing and wrapping joints.

To begin the job, a 60-foot long trench was dug perpendicular to the thoroughfare along the shoulder of the intersecting street. An opening was made over the gas main at the far side of the thoroughfare. The trench was used for driving the two 40-foot lengths of pipe under the thoroughfare and for renewing the branch main along the shoulder of the intersecting street. The job required four men, a truck, and a compressor.

For information on its pipe-driving tools write to the Gas Distribution Department of the Delaware Power Tool Corp., 3306 Market St., Wilmington 99, Del., or use the Request Card at page 18. Circle No. 182.

ROGERS

DEVELOPED A TAGALONG TRAILER



NOW DUMP TRUCKS DO DOUBLE DUTY



ROGERS BROS. CORP.

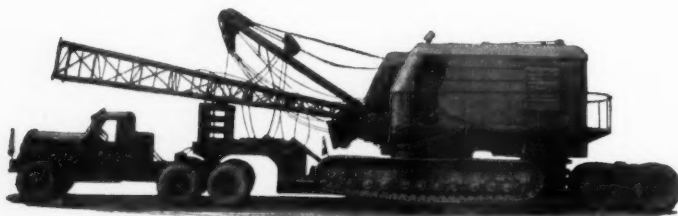
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 459

Whatever Your Concrete Gunning Needs

AIRPLACO Equipment Will Fill the Bill...



MAINTENANCE



CONSTRUCTION



RESTORATION

THE AIRPLACO PORTABLE RIG

MAKES ANY CONCRETE JOB

EASIER • FASTER • BETTER • MORE PROFITABLE

The AIRPLACO Portable Rig combines speed, efficiency, portability and economy to give you the most profitable operation. The rig consists of a job-proved BONDATOR* or NUCRETOR* (NUCRETOR shown in photo) for better concrete gunning. The time-saving MIX-ELVATOR for automatic proportioning, continuous mixing, elevating and screening of materials. And the AIRPLACO SAND-LOADER for a big time and labor savings in loading sand into the unit. The rig can be towed easily and quickly from one job site to another with a minimum of set up time required.

AIRPLACO concrete gunning equipment is available in a wide range of sizes to meet your production and job requirements from 1/2 to 7 cubic yards of aggregate per hour, and using air compressors with 75 to 600 CFM capacity.

*registered trade names

FREE CATALOG

WRITE TODAY FOR FREE CATALOG . . . it will show you all of the many benefits that are yours when you use AIRPLACO concrete gunning equipment, or see your AIRPLACO Distributor.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 460

CONTRACTORS AND ENGINEERS

Case history

High-tensile bolts guard against heavy vibrations

By using high-strength bolts in erecting steel for the new P. H. Glatfelter Co. paper mill in Spring Grove, Pa., the Belmont Iron Works, Philadelphia, Pa., is insuring against vibration damage, as well as saving time and labor.

In the design and erection of a plant of this type, vibration from the operation of massive paper-making machinery and from the overhead cranes that handle the huge rolls of paper must be considered. The intense vibrations subject structural joints to a changing load which may result in fatigue failure.

High-tensile steel bolts manufactured by the Russell, Burdall & Ward Bolt & Nut Co. were used to join the structural members of the paper plant. Resistant to shear stresses, the high-strength bolts have also demonstrated a resistance to shaking loose once tightened to their proper clamping force.

Said to be capable of exerting a much greater clamping force than that provided by other fastening methods, the high-tensile bolts can be tightened to their yield strength—42,000 pounds for a 1-inch bolt—as compared to a maximum clamping force of 22,000 pounds achieved by a 1-inch carbon-steel rivet due to shrinkage when it cools. The shear strength of a fabricated joint depends upon the amount of clamping force.

Another advantage of using the high-strength bolts is in time and manpower savings. Only two men (with no special training) are needed to bolt the connections.

For more information on the high-tensile steel bolts write to the Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 198.

As one man holds a wrench on the head of the high-tensile bolt, another drives the nut home with a pneumatic wrench.

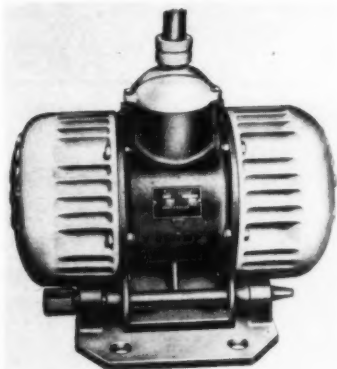


New vibrator speeds work in large molds

■ A new, electro-mechanical concrete vibrator that is reported to speed the placing and setting of concrete in wall

cycle, alternating current.

For further information write to the Syntrol Co., 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 179.



The Sinex electro-mechanical concrete vibrator has a pin-type clamp that attaches to the forms.

forms and other large molds is available from the Syntrol Co. The unit is equipped with a pin-type clamp for attaching to forms.

According to the manufacturer, the Sinex concrete vibrator's 3,600 vibrations per minute pack the mix solidly into corners and around reinforcing, resulting in a denser and stronger end product.

The new vibrator is of the eccentric-weight type. It is a self-contained, totally-enclosed unit that will operate on 220 to 440-volt, three-phase, 60-

Material handlers

■ The "Krone Kar," a material-handling unit that lifts, swings, carries, and positions loads of any size or weight up to 12½ tons is highlighted in a bulletin from the Silent Hoist & Crane Co. This crane mechanism is equipped with three separate power-reversing worm-gear units—one each for hoisting, swinging, and topping. According to the bulletin, the unit operates on gas or diesel power and is equipped with pneumatic or solid rubber tires. Job photos point out various uses of the machine.

To obtain Bulletin 90 write to the Silent Hoist & Crane Co., 841-865 63rd St., Brooklyn 20, N. Y., or use the Request Card that is bound in at page 18. Circle No. 29.

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RESEARCH (not guesswork) plus specialized equipment, engineered and produced in West's own plant, assure sound, economical construction—faster and with less human effort than ever before.

CONSISTENT COST-SAVINGS of up to 75% in materials handling—up to 25% in overall masonry costs—enable contractors to figure lowest bids on job after job from housing projects and light commercial to institutional and industrial construction.

WRITE for location of jobs nearest you where you can see the WEST SYSTEM in action, talk to contractors using it. We'll send new brochure detailing cost-saving features. Sound-color movies available for group showings.

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BRICK BUGGY CORPORATION

4310 Mayfield Road Cleveland 21, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 462

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 461

A Caterpillar D8 lies on its side after plunging into a crevasse near McMurdo Sound in the Antarctic. The 35-ton crawler was retrieved and soon put back in operating shape.



Winterized equipment wins first round in Antarctic battle



Set your sights on an Allis-Chalmers HD-6G



**"ALLIS-CHALMERS HAS A GREAT TRACTOR HERE...
we like our HD-6G for its low cost, big
output, easy transport and simple operation"**

Joe Brown, Ratliff City, Oklahoma

Working on all kinds of jobs, large and small... keeping 9 trucks and 5 Allis-Chalmers tractor shovels busy, that's the Joe Brown Company. Read what owner Joe Brown says about his new Allis-Chalmers 1 1/2-yd HD-6G:

"Working with two trucks on a recent road job, our 6G moved 700 yards of big rock in one day. In dirt

it does even better. The tracks are heavy and long, and power is well coordinated with the bucket. All this means real economy to us; we're profiting with the 6G."

Kenneth Chromieter, HD-6G operator, says: "I like the visibility; and the engine is terrific." And speaking of bucket capacity and strength, Chromieter added, "You know, we had rocks in this bucket they wouldn't let me dump on

the trucks. It sure can do the job."

Yes, the HD-6G "sure can do the job." Stories like this from owners and operators are coming in from all over the country to prove it.

Let your Allis-Chalmers construction machinery dealer demonstrate the 6G for you... show you all the exclusive advantages that will help you get top performance and big production on your jobs.

HD-6G
1 1/2-yd bucket
55 belt hp
19,600 lb

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 463

Specially constructed Caterpillar tractors, the major items in a one-million-dollar inventory of heavy construction equipment which the Navy took along to the Antarctic last fall on its Operation Deepfreeze (see "Seabees Will Battle Winter in Operation Deepfreeze", C&E, November, 1955, page 92), have successfully completed the first phase of their role in this dramatic production at the bottom of the world.

According to Rear Adm. George J. Dufek, commander of the Navy task force which returned to the States this spring after the initial expedition to the polar continent, these machines "performed extraordinary work unloading cargo ships and ice breakers under extreme climatic conditions.

The tractors—specially-built low-ground-pressure D8, D4, and D2 crawlers—also made a more than 100-mile inland trek from the Little America base to cache fuel for a future overland tractor-train expedition to establish a new American base.

Operating in temperatures averaging from 45 to 50 degrees below zero—and occasionally reaching 80 below—and over snow-packed ice broken up here and there by deep crevasses, the Cats proved well equipped to handle the jobs assigned them. Their low ground pressure, wood track carrier rails, and hydraulically actuated drawbars enabled the machines to cope with the adverse conditions of weather and terrain. Special winterizing preparation of the machines by the manufacturer also contributed to the tractors' qualities of endurance.

Just now, while small parties of Seabees are wintering at two bases near the western edge of the polar continent, the crawlers are either being overhauled in a heated garage at the bases or are in "cold storage" until next fall. In storage, the Cats are lined up in the open air, with snow blocks between the machines, and covered with tarpaulins. Snow has covered the machines so that they are insulated to some extent from the low temperatures.

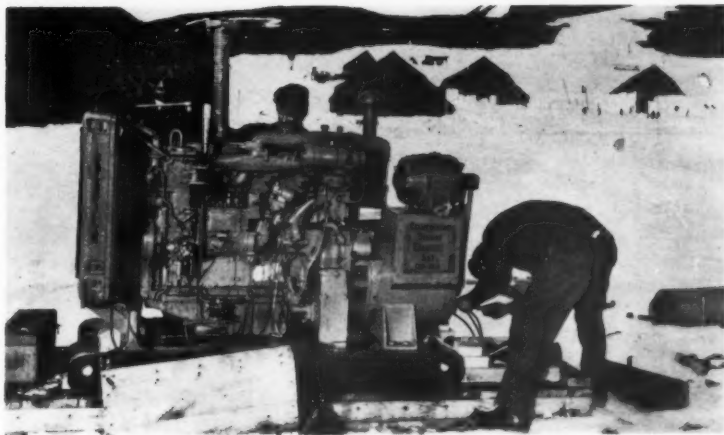
Sixteen Cat electric sets, also taken along when the Navy made its initial excursion to the Antarctic, are providing power for the wintering-over parties. These units, too, were given special winterizing treatment before they left the States.

Dangerous work

This initial phase of Operation

CONTRACTORS AND ENGINEERS

Members of a Seabees mobile construction battalion assemble and service a Cat D315 30-kw electric set which will help provide power for this wintering-over camp near McMurdo Sound.



Euclid gives instructions on equipment maintenance

Maintenance personnel of the Morrison-Knudsen Co., Boise, Idaho have completed a training program sponsored by the Euclid Division of General Motors Corp., Cleveland, Ohio. Instruction covered preventive maintenance, and service procedures for the entire line of Euclid earth-moving equipment.

Part of Euclid's program to help owners to get maximum production from machines at a low maintenance cost, the course was provided with mock-ups, cutaways, and component assemblies by a mobile training unit.

Special emphasis was placed on models owned and operated by Morrison-Knudsen.

Deepfreeze has not been without its accidents, resulting in loss of both life and machines. Twice, cracks in the ice over which these tractors are operated claimed D8's and their operators.

In the first instance, a D8 pulling supplies inland from shipside in the McMurdo Sound area plunged through a crack which opened up under the snow. A 22-year-old construction driver with the Seabees lost his life in the accident.

Another 22-year-old operator was killed when one of the D8's on the initial tractor-train trek rolled into a crevasse which was concealed by lightly packed snow. In both of these instances, the equipment used was also lost.

In spite of these unavoidable accidents, task force officials have expressed complete satisfaction with the construction machinery. Proof of this satisfaction is an order for similar equipment to be taken along on Deepfreeze Operation II next October. This spread will include 26 specially-constructed and winterized Model 955 Traxcavators, three more low-ground-pressure D8's, and 18 30-kw electric sets.

Future work

At present, the Cats "wintering over" at the Little America base include eight D8's, nine D2's, and three D4's. They have been used to haul supplies by tractor-train, unload and handle equipment and building sections (with Hyster cranes mounted at the rear), bulldoze and level camp sites, and pull snow-compacting rollers over airstrips.

In a tractor train, the D8's each pull three sleds for a total tractor payload of 60 tons. This mode of transportation will be used when equipment and supplies are moved about 600 miles inland next October for the establishment of a base in Marie Byrd Land.

These crawlers have required careful servicing, and there have been breakdowns—but no more than were anticipated. All in all, the Naval officials report, the equipment has stood up under its Antarctic test very well.

Operation Deepfreeze is the Naval supporting arm of the United States expeditionary force to the Antarctic, planned for 1956 as this country's participation in the International Geophysical Year.

THE END

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 464

Equipped with Goodyear's barrel-shaped low-pressure Terra-Tires, a Dodge Power Wagon easily negotiates an incline.

Barrel-shaped tire travels any terrain

■ The Terra-Tire, a barrel-shaped, low-pressure pneumatic tire that can be powered through its axle by any conventional drive system, has been announced by the Aviation Products Division of The Goodyear Tire & Rubber Co. The new tire can take trucks, trailers, and other off-the-road vehicles over all types of terrain and roadways at speeds up to 65 mph, according to the manufacturer.

Through a hub and axle fitting, the tire receives its motive power directly

from the engine. This tie-in with a conventional drive system means that a considerable savings in weight, mechanical complication, and cost, it is reported.

Developed by Goodyear for use by the Army's Transportation Corps, the Terra-Tire is said to go where conventional tires often cannot because of its low-pressure inflation of between 3 and 5 pounds. The soft pneumatics tend to swallow up rough, uneven surfaces with little risk of punc-

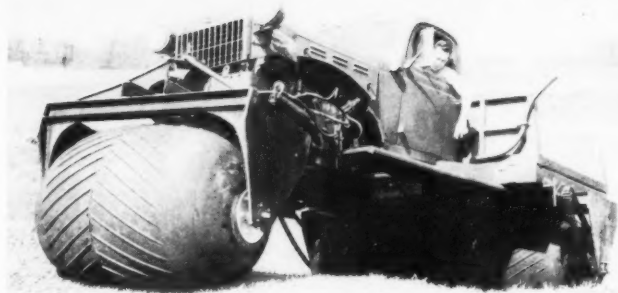
ture or blowout by conforming with uneven surfaces instead of resisting them. The tires act as built-in shock absorbers.

Heavy loads can be sustained because weight is spread over wide

areas of the tires. Terra-Tire equipped vehicles can negotiate hills, dales, marshes and sandy areas without bogging down. Rock-strewn areas can be traversed as easily, the company reports.

The tire is available in a wide range of sizes.

For further information write to the Aviation Products Division of The Goodyear Tire & Rubber Co., Akron 16, Ohio, or use the Request Card at page 18. Circle No. 161.



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- produces powerful high frequency, low amplitude vibrations for best results—10,000 VPM



Model UCV-9

SPECIFICATIONS MODEL UCV-9

HEAD—2 3/4 in. diameter; 14 in. long; weight, 11 lbs.
MOTOR—universal 110 volt ac-dc type; heavy duty brush rigging and commutator; wound armature runs on 2 shielded high speed ball bearings; 10,000 rpm
ECCENTRIC—one-piece alloy steel; designed to match motor characteristics; runs on 2 shielded high speed ball bearings
CABLE—standard 10 ft. operating hose; heavy duty concrete-proof operating switch; 50 ft. rubber-covered 3 conductor cable (3rd wire ground); male 3-prong plug with female connector for attachment to extension cord.

Maginniss Uni-lectric universal concrete vibrators handle medium or high slump concrete effectively. They use on-the-site power (including the dc output of Maginniss Hi-lectric generators, if desired)—are easily carried from job to job. Their cost is low! And, manufactured by the same Maginniss craftsmen who produce heavy duty Hi-lectric vibrators, Uni-lectrics will deliver a maximum amount of dependable service.

Larger contractors will find the Uni-lectric a handy companion for their heavy duty Hi-lectric concrete vibrators—perfect for occasional small pours on bigger jobs.

Ask your Maginniss distributor to show you how the Uni-lectric fits your operation—he'll be glad to demonstrate.



MAGINNISS POWER TOOL COMPANY

154 Distl Avenue • Mansfield, Ohio

Diesel-electric crane

■ A rubber-tire diesel-electric crane with electric travel and rotation is described in a catalog from the Industrial Brownhoist Corp. The crane, available in models with capacities from 25 to 60 tons, is mounted on a 12-wheel carrier. According to the literature, the wagon crane is propelled by a locomotive-type traction motor, and power is furnished by an independent travel generator that is directly connected to the diesel engine. Electric rotation and machinery arrangement are illustrated and described.

To obtain Catalog 553 write to the Industrial Brownhoist Corp., Washington St., Bay City, Mich., or use the Request Card at page 18. Circle No. 124.

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For more facts, circle No. 466

CONTRACTORS AND ENGINEERS

Improved tractor-shovel features large bucket

■ A larger version of the Model HO Payloader with a number of new features has been announced by The Frank G. Hough Co. The new tractor-shovel has a heaped capacity of $2\frac{1}{4}$ cubic yards and a struck capacity of $1\frac{3}{4}$ cubic yards.

In addition to a complete "no-stop" power-shift transmission and torque converter, the new unit is equipped with planetary axles and torque-proportioning differentials.

The torque-proportioning differential, reportedly being introduced to the tractor-shovel field for the first time, is said to combat wheel slipping—thus adding greatly to the over-all effectiveness of four-wheel drive. When the wheel on one side encounters poor tractive conditions and tends to slip, the torque-proportioning differential automatically delivers more power to the opposite wheel. Up to 24 per cent more torque is provided to the wheel with the better traction.

A hydraulic-load shock-absorber is standard on the new model. This device cushions the load during travel cycles, according to the manufacturer, thus reducing spillage and enabling the operator to deliver more material.

Other features of the new HO Payloader include a closed, pressure-controlled hydraulic system; power-steering; four-wheel hydraulic power brakes; an oil-to-air heat exchanger for cooling torque converter and transmission oil; and a "pick-off" outlet for the easy attachment of hydraulically-operated accessories.

The new model is available with either gasoline or diesel power.

For further information write to the Frank G. Hough Co., 822 Seventh Ave., Libertyville, Ill., or use the Request Card that is bound in at page 18. Circle No. 62.



Hough's new Model HO Payloader has a heaped bucket capacity of $2\frac{1}{4}$ cubic-yards and a struck capacity of $1\frac{3}{4}$ cubic yards.

Drilling case histories

■ Abbreviated case histories on 106 drilling and blasting methods used in quarries are contained in a bulletin from the American Cyanamid Co. Condensed in chart form, the cases are divided into those with a face height under 50 feet, and those with a face height over 50 feet. The charts are subdivided into various phases, including formation, stratification, crusher size in inches, shovel size in cubic yards, drill type, detonation, type of explosives, and tons.

To obtain the bulletin write to American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., or use the Request Card that is bound in at page 18 of this issue. Circle No. 141.



"Most dependable units we've ever used!"

—says Frank Marino, Frank L. Marino Corp., Brooklyn, New York

Here's another leading contractor who depends on Gar Wood excavators to help keep jobs on schedule. A 75B with trench hoe and a 75BT truck crane with clam-shell are currently speeding work for this firm on the Linden Housing Project in Brooklyn. President Frank Marino says, "We've been using these units every day since we bought them, and they're certainly the sturdiest, most dependable units we've ever used. No down-time, repairs or service problems at all!"

Marino's operators like Gar Wood "75's" for still another reason. "Our operators say that the Gar Wood units are the easiest machines to operate they've ever worked with," reports Marino. "They especially like the clutch system." Gar Wood instant power actuated drum clutches increase production by reducing operator fatigue.

Gar Wood excavators deliver this kind of low-cost, dependable production because they're designed and built by specialists in $\frac{3}{4}$ yard machines. Find out for yourself how this specialization can pay off in more profit on your next job. Call your Gar Wood dealer, or write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

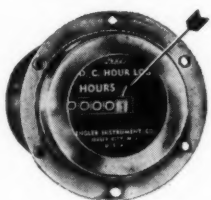


Gar Wood 20-ton truck crane gives Frank L. Marino Corp. the right combination of heavy-duty performance and multi-job mobility. Like all "75's" it has heavy-duty, conical hook double rollers; power steering; direct manual controls; optional hydraulic coupling; easy convertibility for work with a complete line of attachments.



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For more facts, circle No. 467

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Gar Wood
Winches



Gar Wood-St. Paul
Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 468



The Kenworth 802-B dump truck has a truck hauling capacity of 32 cubic yards.

New earthmover dump has 32-yard capacity

■ A new earthmover truck-tractor with dump semitrailer, called the 802-B, is being manufactured by the Kenworth Motor Truck Co. The new hauling unit has a truck capacity of 32 cubic yards and a gross combined weight of 165,000 pounds.

According to the manufacturer, this new earthmover dump is a departure from conventional heavy-duty dump trucks because it provides more flexibility and ease of handling, as well as greater capacity for heavy hauling where maneuverability and durability are prime requisites.

The 802-B is powered by a Cum-

mins 300-hp turbocharged diesel engine. In the dumping operation, while the entire trailer raises, the tractor moves backward and under the trailer. The fifth wheel is of a rugged pin-type construction, insuring good stability both in dumping and over-the-road operation. A special guide and equalizer reportedly stabilizes the body during dumping, so that there is no strain or twist on the twin, three-stage Kenworth telescopic hoist.

The entire vehicle is of all-welded steel construction, is strongly braced with box section ribs, and has longitudinal reinforcement between the ribs at the body sides. The body is flared at the sides for easy loading.

The offset one-man enclosed cab is said to provide exceptional visibility coupled with safety. The driver's seat is fully adjustable, and there are access doors on both sides.

A special feature said to mean greater economy and efficiency in on-the-job servicing is the interchangeability of axle outer end parts between the truck and trailer. Parts such as wheels, rims, bearings, brake assemblies, and tires may be used either on the tractor or trailer.

For further information write to the Kenworth Motor Truck Co., P. O. Box 3224, Seattle 14, Wash., or use the Request Card at page 18. Circle No. 157.

Florida division for C. I. T.

The C. I. T. Corp., industrial financing firm of New York, N. Y., has scheduled the opening of its new Jacksonville, Fla., division for September of this year. The company's present representative in Florida, J. J. Heater, will head the new division.



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For more facts, circle No. 470

CONTRACTORS AND ENGINEERS



The Rubberite System of concrete waterproofing was used on this midwestern stadium involving application on approximately 22,000 square feet.

New system renders concrete waterproof

■ A new method for surfacing and waterproofing exterior concrete areas is announced by Plant Maintenance, Inc. The method involves two new materials that are said to provide strength, flexibility, and excellent water resistance. It is called the Rubberite System.

In place of the usual reinforcing membranes, the method combines a woven glass cloth and a liquid rubber compound known as Rubberite. Embedment of the non-rotting, non-shrinking cloth into the rubber provides a waterproof barrier that moves and gives with expansion and contraction, but will not fracture.

The Rubberite System is reported to be less costly and more effective than other methods. It is most versatile in that a wearing surface of either a latex or other composition base may be applied over the waterproofing layer.

For further information write to Plant Maintenance, Inc., 650 Green Rd., Cleveland 21, Ohio or use the Request Card at page 18. Circle No. 76.

Hydraulic truck hoist dumps at 50-degree angle

■ A new hydraulically-operated truck hoist with a lift capacity of from 3 to 15 tons is the latest addition to the Schwartz Mfg. Co.'s line of truck equipment.

Known as the Schwartz Uni-Link hoist, the unit is available either in the conversion model, for installation on the original truck frame and truck body, or in the standard model, with tubular steel subframe and long beams. Both models convert any truck into a dumping unit.

Uni-Link hoists use a patented, unitized, self-stressed, hoisting mechanism with power linkage. The manufacturer states that the mechanism offers peak performance at all stages

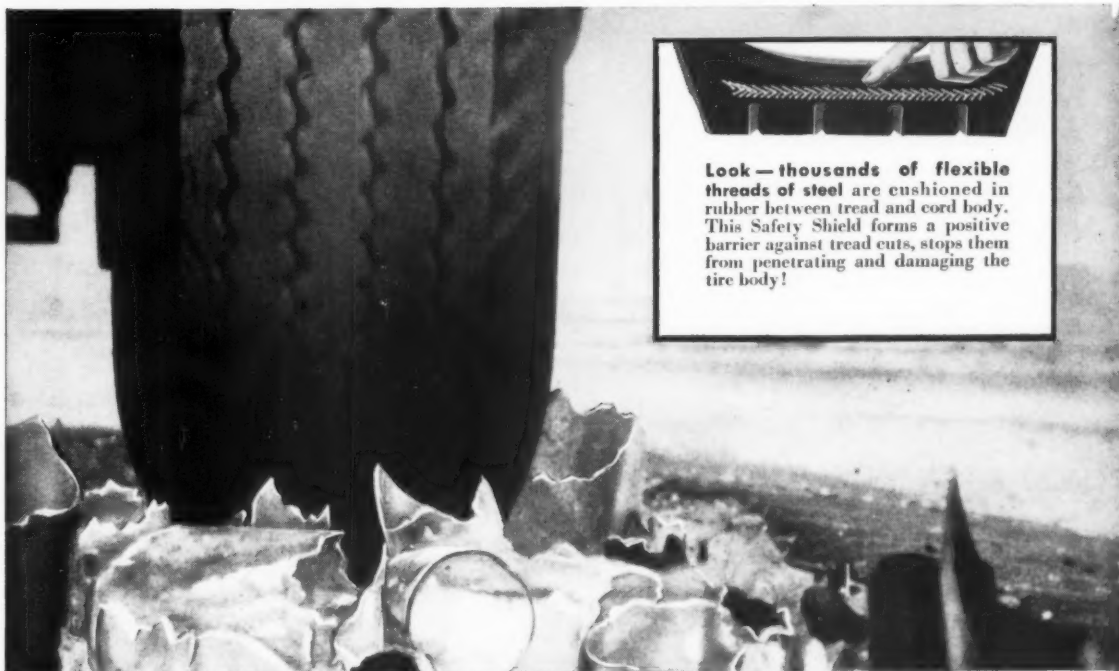


of lift and a 50-degree dump angle.

For further information write to the Schwartz Mfg. Co., Lester Prairie, Minn., or use the Request Card at page 18. Circle No. 61.

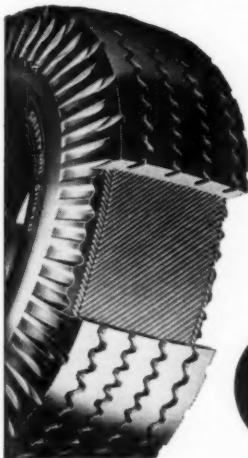
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by new exclusive SAFETY **STEEL** SHIELD



Look — thousands of flexible threads of steel are cushioned in rubber between tread and cord body. This Safety Shield forms a positive barrier against tread cuts, stops them from penetrating and damaging the tire body!

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You are looking at an entirely new kind of highway truck tire. It combines the strength of steel with full flexibility, light weight and soft ride—without increased inflation.

Because this new U.S. Royal is invulnerable to cuts and ruptures in the vital tread area, it gives you the longest, most trouble-free service in truck tire history. Because steel cord shields its carcass, it remains undamaged for more safe recapping, mak-

ing it the most economical of truck tires. You'll find new U.S. Royals like this cost surprisingly little. Ask your U.S. Royal Dealer now. And remember—you can specify them on the new equipment you buy!

AND COMING SOON!

An all-new, all-wheel, all-job ON-AND-OFF-THE-ROAD TIRE—new U. S. Royal Super Fleetmaster with SAFETY STEEL SHIELD



United States Rubber

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IN CANADA: DOMINION RUBBER CO., LTD.

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avoid legal pitfalls

Picketing was illegal

THE PROBLEM: A general contractor employed union labor, but was picketed because a haulage subcontractor did not. A picket carried a sign to the effect that the teamsters' union was on strike against the contractor "for better wages and working conditions". Most of the union workers on the project stopped working. Was the company entitled to a court injunction to bar picketing?

THE ANSWER: Yes. (Cain, Brogden & Cain, Inc., v. Local Union No. 47,

International Brotherhood of Teamsters, etc., 285 S. W. 2d 942, decided by the Texas Supreme Court, and reversing a contrary decision by the Texas Court of Civil Appeals, 272 S. W. 2d 543.)

The Supreme Court decided that peaceful picketing loses its protection under the constitutional guaranty of free speech if one of its purposes is contrary to public policy, whether that policy be declared by the courts or by legislation. The picketing in this instance violated public policy expressed in a Texas statute.

Under the circumstances, the general contractor was not bound to seek a decision by the National Labor Relations Board and rightfully sued in the Texas state courts for an injunction.

The Supreme Court's decision rested upon the fact that when subcontracts were made, there was none between the general contractor and the union requiring the subcontractors to hire union labor and comply with union working conditions.

Scope of lien right

THE PROBLEM: A Tennessee statute gives a lien against railroad property for work, labor, services, or materials furnished in improving such property. Was a lien enforceable (1) for a subcontractor's rental of heavy earth-moving equipment for use in improvement construction and (2) for the cost of repairing and replacing machinery parts necessitated by such use?

THE ANSWER: (1) Yes. (2) No. (R. L. Harris, Inc., v. Cincinnati, New Orleans & Texas Pacific Ry. Co., 280 S. W. 2d 800, decided by the Tennessee Supreme Court.)

Compromise released income tax claims

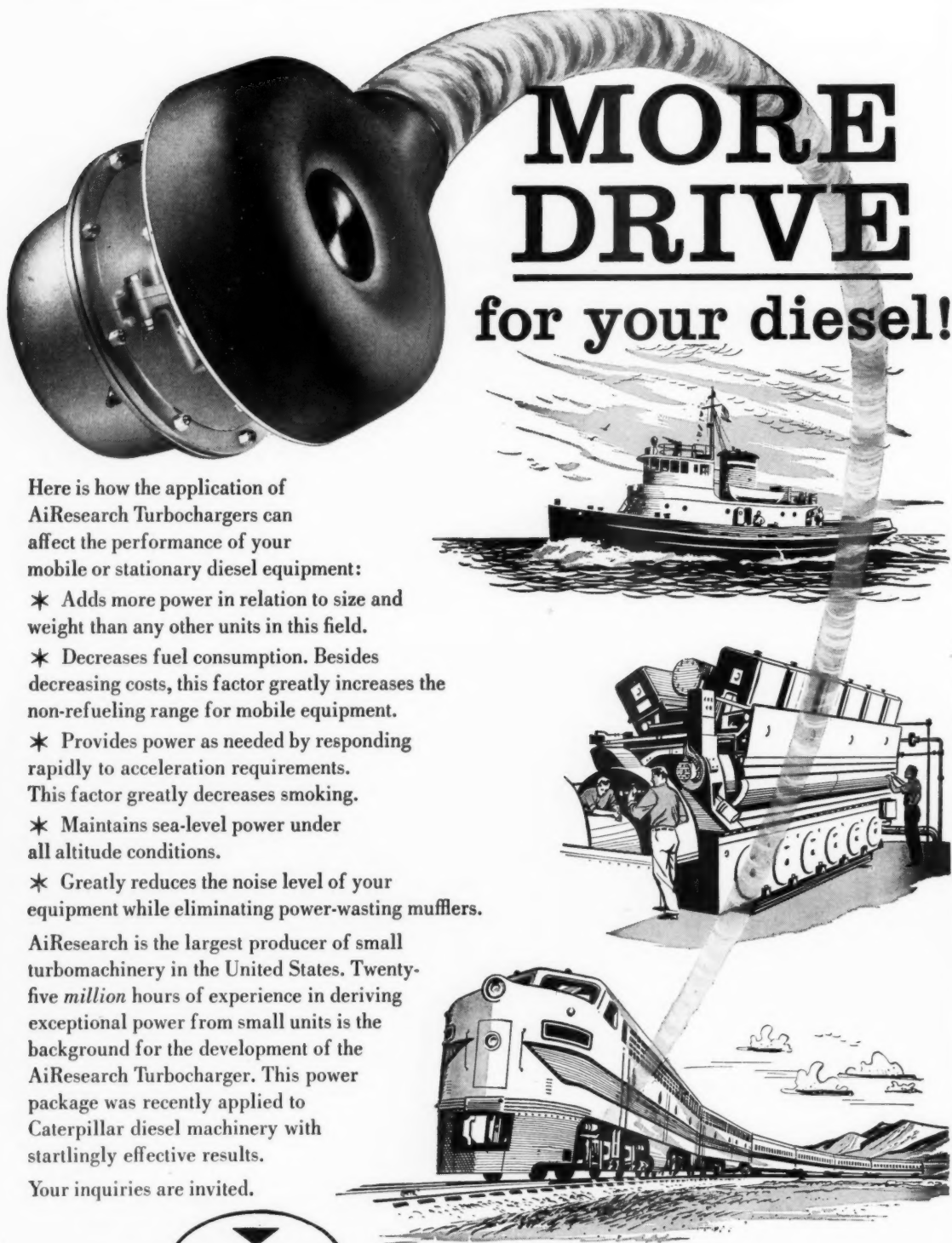
THE PROBLEM: In 1942, a contractor was induced by the government to undertake a \$5,000,000 war-plant construction job. The job was later enlarged, involving \$2,000,000 increased cost. Six years were spent in controversies concerning the amount due the contractor and what he owed the government for income taxes. In 1949, the Attorney General, on behalf of the government, accepted the contractor's offer to receive \$954,100 in settlement. Did that prevent the Internal Revenue Bureau from later attempting to compel the contractor to pay income taxes on account of the proceeds of the settlement?

THE ANSWER: Yes. (Sanders v. Andrews, 121 Fed. Supp. 584, decided by the United States District Court, Western District of Oklahoma.) The decision, rendered May 13, 1954, is subject to review by the United States Court of Appeals and, possibly, by the United States Supreme Court.

The conclusions reached by Judge Voight rest upon his conception that it circumstantially appeared that the compromise was not merely intended to settle the contractor's claim as to the balance due him, but also the government income tax claims which were in dispute at the same time.

Invalid promises

THE PROBLEM: A pipeline-construction contract required that the work be done in Kansas and Missouri between December 17 and February 23. No provision was made for extending the time in case of bad weather. Rep-



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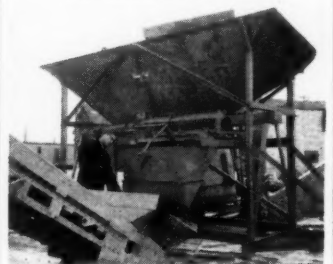
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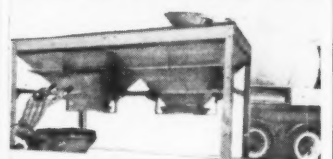
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CONTRACTORS AND ENGINEERS

representatives of the pipeline company orally assured the contractor, after the contract had been made, that the company would protect him against losses resulting from being required to proceed during bad weather. Was the promise enforceable?

THE ANSWER: No. (Smith v. Phillips Pipeline Co., 128 Fed. Supp. 61, decided by the United States District Court, Northern District of Oklahoma.)

The court said that making of the promise had not been proved, but that if it had been made, it was not enforceable because it was not covered by the written contract. The court applied a rule of law that a promise to pay for something that another party is already bound to do under an existing contract without further payment is not binding. Here the contractor was bound to complete the job regardless of weather conditions. Nor, said the court, could the laying of the pipeline in unseasonably bad weather be regarded as "extra work," within the meaning of the contract.

Guarantee of payment was valid, though oral

THE PROBLEM: In New York, as in most other states, a promise to pay a third person's debt is not enforceable unless it is written and signed. But this law does not apply where supplies or services are furnished to one person on the faith of a third person's promise to pay, for this makes the third party not a guarantor of the debt, but the primary and original debtor.

To facilitate completion of a building contract, a subcontractor agreed to reduce his claim against the prime contractor, and the owner, in turn, orally agreed to become co-debtor with the prime contractor. Was the owner's oral promise legally binding?

THE ANSWER: Yes. (Holtzman v. Country Wood, Inc., 142 N. Y. Supp. 2d 868, decided by the New York Supreme Court, Kings County.)

The owner thus became a primary debtor.

Contract awards under alternative bidding

THE PROBLEM: The Connecticut Highway Commissioner invited alternative bidding on reinforced concrete pavement and bituminous concrete pavement. Under state law, could he determine the type of pavement to be adopted, after receiving the bids, and award the contract to the lowest responsible bidder for that type of construction?

THE ANSWER: Yes. (De Felice & Son

v. Argraves, 118 Atl. 2d 626, decided by the Superior Court of Connecticut.)

The court dismissed a suit brought by the lowest bidder on bituminous concrete construction to enjoin an award to the lowest bidder for reinforced concrete.

The decision is subject to review and possible reversal on appeal, if any, to the Connecticut Supreme Judicial Court.

Contractor not liable for injury to careless child

THE PROBLEM: A cement mixer on or near a sidewalk was being used by a building contractor when the plaintiff, a 10-year old boy, placed his hand in it and was injured. Was the con-

Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

tractor liable in damages?

THE ANSWER: No. (Centrello v. Basky, 128 N. E. 2d 80, decided by the Ohio Supreme Court.)

The court did not believe the youngster's testimony that he had slipped on sand or dirt thrown on the sidewalk by the mixer, and accidentally thrust his hand into the machine.

Super drive for a super grader

TO GET more "push-power" at the blade, Galion uses an Allison TORQMATIC DRIVE in its new T-700 Grade-O-Matic grader.

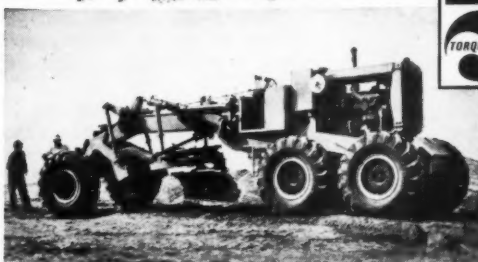
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For full information on the Galion T-700 see your Galion dealer or write Galion Iron Works, Galion, Ohio.



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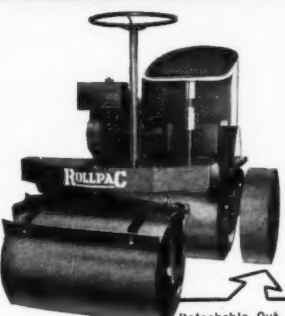
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avoid legal pitfalls

But the decision of the court is not inconsistent with the idea that a pedestrian on a sidewalk might hold a contractor liable for injuries in a case where sand or dirt or other substance has been thrown onto a sidewalk by a cement mixer—assuming that the pedestrian used reasonable care for his own safety.

Contractor on levee was not liable to abutter

THE PROBLEM: A levee contractor completed his work according to plans and specifications and it was accepted and paid for by the state in January. In May, the levee broke and

flooded adjacent lands. Did the landowner have a valid claim for damages against the contractor?

THE ANSWER: No. (*Ortego v. Caldwell*, 77 So. 2d 151, decided by the Louisiana Court of Appeal, First Circuit.)

The court applied the general rule of nonliability of contractors to third parties for breach of a construction contract where the work has been completed and accepted by the owner.

Reference was made to a previous Louisiana case where it was decided that a contractor was not liable to a third person for damage due to defects in work when the injury did not occur until three years after the work had been completed and accepted. But the Court of Appeals said that a lapse of time after acceptance is immaterial.

Interstate commerce case in jurisdiction of NLRB

THE PROBLEM: A paving company brought suit in a Kansas court to enjoin a labor union from picketing its supply base and work projects. Although there was no existing labor dispute, the union was attempting to coerce the company into entering a bargaining agreement in violation of state and federal law. In view of the fact that the company's operations affected interstate commerce, did the state courts have jurisdiction over the suit?

THE ANSWER: No. (*Kaw Paving Co. v. International Union of Operating Engineers, etc.*, 290 Pac. 2d 110, decided by the Kansas Supreme Court.)

The matter should have been brought before the National Labor Relations Board.

City's general fund not liable for paving

THE PROBLEM: Under North Dakota statutes were a city's general funds liable for extra cost of street paving due to changes in plans made during progress?

THE ANSWER: No. (*Meggary Bros. v. City of St. Thomas*, 66 N. W. 2d 704.)

The governing statutes specified that paving costs should be paid only out of funds raised by special assessment of benefitted property, and required paving contracts to so provide.

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Owner is held liable for injury to worker

THE PROBLEM: A landowner who engaged a contractor to clear debris from an irrigation pipe furnished a tractor and its operator. The plaintiff, employed by the contractor, was injured when the owner negligently signaled to start the tractor. Were the owner and the tractor operator liable?

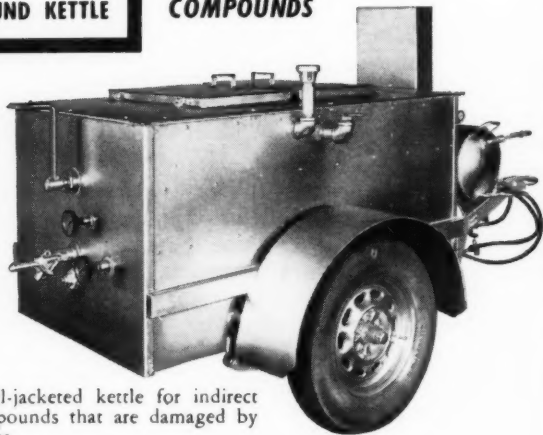
THE ANSWER: Yes. (*Johnston v. Orlando*, 281 Pac. 2d 357, decided by the California District Court of Appeals, First District.)

The decision rested upon the fact that the owner had agreed not only to furnish the tractor but also to control its operation. A fundamental rule of law that one who entrusts work to an independent contractor but who retains the control of any part of the work is liable for injury resulting to third persons from negligent failure to use due care in the exercise of that control also influenced the decision.

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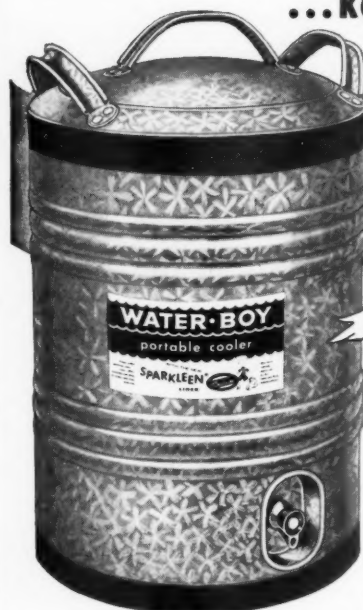
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CONTRACTORS AND ENGINEERS

Hydraulic scarifier rips any hard-packed surface

The fully-hydraulic Teale scarifier, available in four sizes, is reported able to rip any hard-packed surface including rocky or frozen soil, clay, macadam, or shale. The width of the cut is between 5 and 7 feet and the number of teeth varies between six and eight, depending upon the model.

The Teale scarifier attaches to the crawler drawbar. Its carriage is of a square, all-welded box construction using 1-inch steel plate. The teeth are locked in position with steel wedges that drive them back over a locking bar. Twin hydraulic cylinders adjust the ripping depth from 9-inch penetration to the full-up position

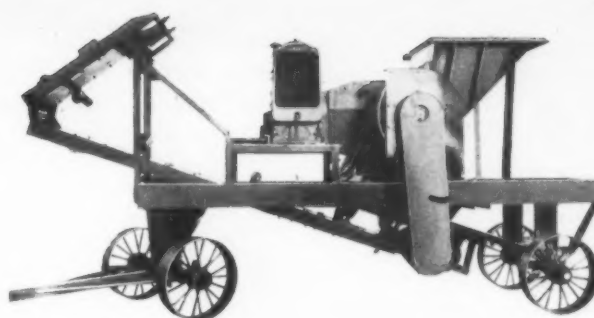
(teeth 20 inches above ground level).

The Teale rig is made to fit Caterpillar and Oliver equipment.

For further information write to Teale & Co., Box 308, Omaha, Neb., or use the Request Card at page 18. Circle No. 89.

Goodyear plans addition to Topeka tire plant

New buildings of brick and steel construction will add approximately 250,000 square feet of floor space to the Topeka, Kans., tire plant of the Goodyear Tire & Rubber Co., Akron, Ohio. The new addition will be used for the manufacture of retread rubber and facilities to increase earth-mover-tire production.



Portable crushing plant designed for small jobs

A portable rock-crushing plant has been placed on the market by Pioneer Engineering Works, Inc. Designed especially for smaller jobs for which the finished product need not be separated into various sizes or be within a specific gradation range, the Pioneer No. 2 plant consists of a truck-mounted jaw crusher and delivery conveyor and can be moved intact.

Rock or gravel may be fed to the steel hopper on the jaw crusher by power shovel, truck, or small dozer. The crusher is of the overhead eccentric type with a 10x16-inch feed opening. Oil-lubricated and adjustable while in motion, the crusher can accommodate rocks up to 8 inches in diameter. Its output ranges to 40 tons per hour, depending on the type of material and the setting of the jaw.

The channel frame discharge conveyor is 16 inches x 20 feet, hinged at the delivery end for folding while in travel, with 4-inch-diameter idlers. The conveyor is driven from the crusher through a chain and gear reducer to the tailshaft. The crusher is driven direct from any 20 to 30-hp unit through a V-belt drive.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave. N. E., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 81.

The new Pioneer No. 2 crushing plant features a truck-mounted overhead eccentric-type jaw crusher and a folding delivery conveyor, and can be moved intact.

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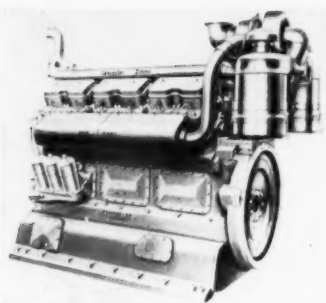


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A left rear view of the Caterpillar D397 diesel.

Two big V-type engines offered in four versions

■ Two new heavy-duty V-type engines have been introduced by Caterpillar. Capable of producing up to a maximum of 650 horsepower, the new units are available in turbocharged, roots-blown, naturally aspirated, and spark-ignited versions.

The new 8 and 12-cylinder D375 and D397 engines are of a four-cycle design, as were their Cat predecessors. Principal differences between the new engines and the former models are in the cylinder heads, exhaust manifolds, method of supercharging, and—in the case of spark-ignited engines—the fuel used and the method of igniting it.

Major features of the former models, such as the completely water-jacketed cylinder heads and the low-ejection-pressure, precombustion chamber-type fuel-injection system, have been retained.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 93.

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Case history

Augur drill replaces three wagon drills

One McCarthy heavy-duty vertical augur drill replaced three compressed-air wagon drills and saved contractor John F. Nichols \$7,500 per month in blast-hole drilling operations for laying pipe and putting in roads and terraces for the Aliamanu Homes project near Honolulu in the Hawaiian Islands.

Six-foot-deep blast holes that required 30 minutes for a wagon drill to cut were drilled in an average of 30 seconds by the McCarthy unit. Tungsten-carbide rock bits were used on the McCarthy drill, which bored in formations that varied from hard coral to basalt.

Nichols reported that the McCarthy rig required one-third the man-hours to do the job formerly done by the three wagon rigs. He was also able to use the augur drill for outside rental operations. He estimated that the augur drill's operational cost was approximately half that of operating an air drill.

For further information on the augur drill write to The Salem Tool Co., 769 S. Elsworth Ave., Salem, Ohio, or use the Request Card at page 18. Circle No. 192.

Outdoor lighting

■ Weatherproof assembly units for nighttime construction work, maintenance-yard lights, and portable lamps are featured in a catalog from

the Stonco Electric Products Co. Also shown are wiring troughs, cluster fittings, light fixtures, and spotlights. Each unit is pictured and described, complete to specifications. A complete catalog index is included.

To obtain Bulletin No. 154 write to Stonco Electric Products Co., 333 Monroe Ave., Kenilworth, N. J., or use the Request Card at page 18. Circle No. 117.

Challenge opens new plant

The Challenge Mfg. Co., Maywood, Calif., has opened a new factory in Bryan, Ohio, for the manufacture of Pacemaker truck mixers. The new plant will offer factory installation and drive-away economy along with faster delivery.

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The Model DW630 diesel-powered tandem-axle dump truck, one of the units in GMC's 1956 heavy-duty line, is recommended for such applications as hauling crushed rock.

Heavy-duty truck line includes two new models

■ An improved and expanded line of rugged heavy-duty GMC trucks designed to give peak performance in both highway hauling and off-the-road operations has been announced by the GMC Truck & Coach Division of General Motors.

The heavy-duty GMC's for 1956 include an expanded line of versatile tandem-axle models, a wide range of four-wheel vehicles with more powerful gasoline and diesel engines, and many engineering advances.

Providing a wide range of hauling capacities, the line ranges from four-wheel gasoline-engine models with 22,000-pound gvwt to tandem-axle vehicles with 90,000-pound gross combination weight. Several entirely new models, including a Model FW550 dual-purpose, tandem-axle tractor and a tandem-axle Model W670, are offered.

The Model FW550 has a front axle rated at 14,000 pounds and a 34,000-pound rear axle, a five-speed synchromesh transmission, 210-hp V-8 engine, power steering, and other features which reportedly make it ideal for concrete-mixer and dump-truck operations.

With a 59,000-pound gvwt, the Model W670 is especially recommended for heavy trucking operations in states where high gvwt's are permitted. It offers a choice of an 11,000 or 14,000-pound front axle and a 48,000 or 50,000-pound rear axle, and has as standard equipment a five-speed main and three-speed auxiliary transmission, a 225-hp gasoline engine, and double channel frames.

Six and eight-cylinder gasoline engines ranging from 160 to 225 horsepower, and diesels from 150 to 230 horsepower are offered in various models.

On tandem-axle vehicles, an inter-axle differential including a lockout feature is said to give peak highway and off-the-road performance. The lockout disconnects the inter-axle differential for off-road operations, but connects it for highway use.

Also standard equipment are tubeless tires. With only two parts—the tire and rim—instead of the five or six on conventional tires, the tubeless tire is lighter and permits greater payloads and smaller parts inventories for truckers. It also eliminates the danger of rings blowing off.

For further information write to the GMC Truck & Coach Division, General Motors Corp., 660 S. Blvd. E., Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 166.

Largest overhead crusher can handle up to 950 tons

■ What is believed to be the largest overhead eccentric jaw crusher in current market production has been introduced by Universal Engineering Corp. The unit has been designated the 4448 WRB.

The Universal 4448 has a minimum capacity of from 200 to 350 tons per hour at a 4-inch discharge opening and a capacity of from 800 to 950 tons per hour at the maximum 12-inch opening. Openings are adjustable at increments of 1 inch.

Features of the new model include stress-relieved, welded-steel base; extra-long jaws (102 inches stationary; 115 1/4 inches movable); spherical self-aligning bearings hydraulically

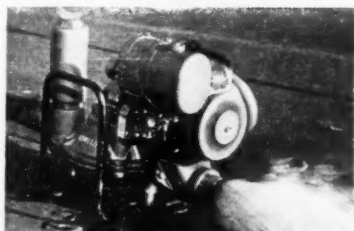
removed; and rocker-type steel toggle plate, steel-plated shims, and hydraulic cylinders.

For further information write to Universal Engineering Corp., 625 C Ave. N. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 74.

Dravo elects executive

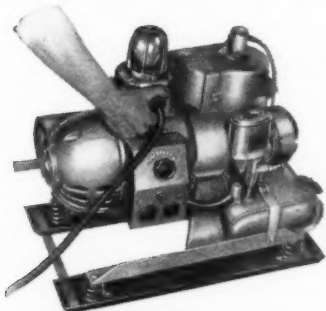
Dravo Corp., Pittsburgh, Pa., has elected Robert W. Marvin a vice president of the firm. A director of the corporation, Marvin is also general manager of the engineering works division. He is a member of the Society of Naval Architects and Marine Engineers, the Society of American Military Engineers, and the American Ordnance Association.

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PORT CHESTER, N. Y.

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"...Our Radio System Paid for itself on this one Job Alone!"

—Says Al Lizza, President, Lizza & Sons, Inc.
Contractors for Garden State Parkway



Trucks operating on parkway construction are under radio control at all times.

"With our operations extending over 22 miles of the Garden State Parkway, I can pick up the mike and talk to any man on the job. If any of the rigs break down, we get a service truck out on the road in a few minutes. Operations at the plant can be quickly adjusted, too, so that our fleet of hot-mix doesn't pile up at the 'down' machine."

Lizza & Sons has mobile units in the superintendent's car, master mechanic's and foremen's trucks, and other units on the lube trucks, two of the graders and five of the pickups. A control station at the asphalt plant keeps a dispatcher in touch with trucks at all times. Radio has earned hundreds of dollars a month in time saved by quick intercommunication between personnel. "It's likely our radio system paid for itself on this one job," adds Mr. Lizza.

Savings on the job mean increased profits. You'll find out, too, that actually radio costs you very little because it's self-amortizing.

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RADIO CORPORATION of AMERICA
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(Top) Al Lizza at mike in field office talks to service trucks on road; and (above) Wally Slanson, Superintendent, trouble shoots operations from his car.



Hubert H. Everist, Sr., Western's founder and chairman of the board.



View from the back seat

Even retirement can be a sound business move, says this farsighted midwestern contractor

by WILLIAM T. DARDEN, assistant editor

In the pursuit of a successful business career, of whatever type, there's a time for everything—even retirement.

At least that's the thinking of Hubert H. Everist, chairman of the board of Western Contracting Corp. Founder and for 30 years president of this heavy construction firm, he has in the last decade taken a progressively smaller role in its management.

The view from the back seat is good, too: the firm is growing like never before, operations are on a more efficient, businesslike basis, and

Mr. Everist is enjoying an active retirement.

Mind you, his retirement and gradual withdrawal from the management was all Mr. Everist's idea. It was a farsighted business move, and he's delighted with the results.

Now Western has made a pretty big name for itself in recent years in the heavy earthmoving and construction field, but in case you're a little vague on the facts, these figures will fill in the picture: 153,654,451 cubic yards of earth and rock excavated in the last 15 years; 4,648,182 cubic yards of pavement and structural con-

crete placed during the same period; \$174,563,878 worth of contracts handled in the 15 years.

To bring the picture right up to date, this Sioux City, Iowa, firm put in place a total of \$26,834,000 worth of work last year, and is at present working on contracts totaling nearly \$20 million which are scheduled for completion this year. Dam earthwork and superhighway construction account for the major portion of this current work.

Hubert Everist incorporated his construction firm back in 1917 and for many years directed its operations.

BRIDGE PIERS:

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One of the piers erected for Texas Highway Dept. for span over Pecos River.



Photo shows work being carried through at turn of year. Grain elevators, apartment houses, water towers, factories, silos—these and other structures are also handled economically and dependably by the **proven** "Concretor" hydraulic method. Used by scores of careful contractors.

Synchronized jacking. Complete service at one all-inclusive rental cost. On-the-job engineers.

The "Concretor" Hydraulic Jack Unit

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ECONOMICAL DEPENDABLE COMPLETE FROM A TO Z

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CONTRACTORS AND ENGINEERS



The Gavins Point Dam near Yankton, S. Dak., is one of a chain of control structures being built along the mighty—and often destructive—Missouri River. Western's \$13,500,000 contract on this project covered earth and rock excavation, dredging, and concrete work.



This Western double paving train, working on a stretch of the Ohio Turnpike, includes two Koehring 34-E dual-drum pavers supplied by International L-184 batch trucks, two Blaw-Knox spreaders, two Jaeger finishers, two Koehring longitudinal floats, and a Flex-Plane belt finisher.

In 1946, however, at an age when most men are just beginning to realize their full business potential, he resigned the presidency of Western, assumed the position of chairman of the board, and began little by little to withdraw from active management of the firm.

Although he still keeps informed of the company's operations, he has been, in his own words, "out of it" the last few years. He and Mrs. Everist spend much of their time traveling, while a capable group of executives—including four of their sons—manage the construction firm and a

sand and gravel company, L. G. Everist, Inc.

A change for the better

"The company operates in a better fashion now than it ever did as a one-man business," Mr. Everist declares, insisting that in a corporation "everyone pulls his own weight." Too, he maintains that Western's operations are conducted on a more businesslike basis today because younger blood has taken over the management.

President of Western since 1946
(Continued on next page)

MAN-SIZE 36" Kolman 'a Brute for Production!



50' x 36" KOLMAN Portable Conveyor-Screen Plant with built-in feeder and wing walls on a Peter Kiewit Sons' Co. job in Montana.

Loads Out 15-Ton Trucks In Less Than a Minute!

Here's the conveyor-screen plant that really puts it out! Contractors throughout the country are finding that the KOLMAN Model 101 comes through with top production under the severest operating conditions.

Shown above is the 50' x 36" KOLMAN plant owned by Peter Kiewit Sons' Co. It's capable of loading out these 15-ton trucks with highway base course material in less than a minute. No wonder they say it's a "brute for production!"

It carries a vibrating screen 8' x 48" without additional support, and the screen need not be removed for transportation—it just folds under out of the way.

LOOK AT THESE FEATURES

Self-cleaning tail pulley, bar type self-lagged head pulley, all anti-friction bearings, choice of greaseless or regular ball-bearing idlers,

pneumatic tires, separate clutch for individual operation of vibrating screen and conveyor belt, motor-to-ground controls, hydraulic hoist with "V" type carriage trucks for low road clearance, and self-cleaning steel belt cover.

The steel dozer trap with built-in plate feeder, available as optional equipment is an integral part of the conveyor and also fully portable. Model 101 KOLMAN Portable Belt Conveyor is available in 18 to 36 inch belt widths and in lengths as desired.

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KOLMAN Manufacturing Co.
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Send literature on:

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Quote price size or capacity

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City



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City of Winston-Salem (N.C.) sweeps downtown walks with their Tennyant "75" Sweeper.

sets a new standard in clean, LOW-COST sweeping

In busy downtown areas, where clean sweeping counts most, but is costly—a compact TENNANT Power Sweeper pays for itself fast. It not only does the work of a crew of men; it sets a new standard for clean work. You'll see the difference.

Sweeping easily around parked cars, its powerful brush-and-vacuum system rapidly cleans a 48" path. Picks up dust, dirt, paper, sand—the usual loose light litter found in gutters, on walks and in alleys. Does a remarkable job.

It's rugged . . . compact . . . easy to use; and superbly engineered for long, dependable service.

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SPECIALIZED MAINTENANCE EQUIPMENT

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(Continued from preceding page)

has been M. B. Jones, who came to the firm from the Nebraska State Department of Roads and Irrigation.

He was associated with the Nebraska highway department for 23 years, the last six as state highway engineer.

Other officers of the company are C. W. Barnhart, vice president; R. A.

Everist, vice president; L. Garland Everist, secretary and general superintendent; and Hubert H. Everist, Jr., treasurer and equipment superintendent.

L. G. Everist, Inc., of Sioux Falls, S. Dak., the sand and gravel firm which was originated by his father as a coal jobbing firm in Havana, Ill., in 1876, also was actively managed by Mr. Everist until recent years. There, too, he has seen fit to take a back seat, so that he now serves as first vice president. The three sons associated with him in the construction firm also hold offices—Garland as president, Hubert, Jr., as vice president, and R. A. as secretary and general manager—while a fourth son, T. Stephen, is treasurer and equipment manager.

Another son, Daniel, is working his way up in the construction firm as his father and brothers have done before him.

When it comes to contracting, history is never as interesting as current activity, but a few more facts, dates, and figures will help fill in the background of Western and the man that brought it to a position as one of the nation's better-known construction firms.

In 1909, after finishing college (Purdue), Hubert Everist worked with his father in the coal jobbing firm. Shortly thereafter, the L. G. Everist company went into the production of aggregate materials, and today that company does an annual sand and gravel business valued at about \$2,500,000. Besides the headquarters at Sioux Falls the firm has plants at Hawarden, Iowa; Dell Rapids and Rapid City, S. Dak.; Topeka, Kans.; and Bristol, Ind.

Began with small jobs

Construction was opening up in the midwest about the time young Hubert left college. "The little towns

wanted to dig themselves out of the mud," he recalls. Western therefore came into existence, and the firm initially engaged in such light construction work as excavating for basements and paving asphalt streets for municipalities.

By 1920, however, the company had branched out and was doing about \$1,500,000 worth of work a year. Reclamation work in the far west, canals, airbases during the 1940's.



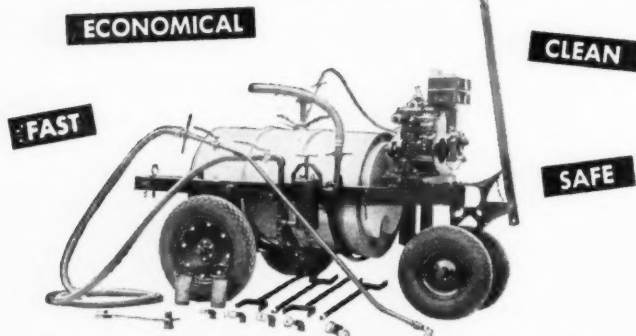
Marshall B. Jones, president of Western since 1946.

toll-road construction, and work on the big dams along the Missouri River are project highlights in the company's history.

Western's biggest job to date has been on the Fort Randall Dam at Pickstown, S. Dak., where earth and rock excavation, dredging for diversion of the river, and construction of an earth-fill dam were covered by contracts totaling \$22 million. The Indiana Turnpike gave the company contracts totaling \$15,500,000; the Ohio Turnpike, \$14 million. Western's portion of the Gavins Point Dam project at Yankton, S. Dak., amounted to \$13,500,000.

One of Western's current jobs is

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TARRANT MFG. CO.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 491



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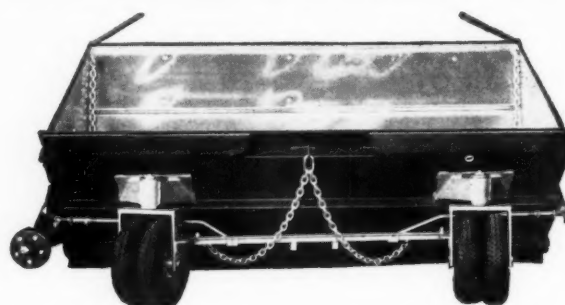
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This new power take-off for all medium duty work offers all the advantages of the complete TULSA line—highest quality, nationwide distribution and service.



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CONTRACTORS AND ENGINEERS



Hubert Everist, Jr., treasurer and equipment superintendent of his father's firm.

the Oahe Dam at Pierre, S. Dak., the third Missouri River Dam on which it has worked. Here earth and rock excavation and earth-fill work by Western has amounted to moving some 33,000,000 cubic yards under contracts that have totaled \$7 million to date.

Although it prefers heavy excavation work, either wet or dry, Western has engaged in other kinds of construction over the years. Equipment outlays and other considerations now limit the firm to jobs of at least \$1,500,000, however. Besides the Oahe Dam, current projects include sections of the Indiana and Kansas Turnpikes and a dredging job at Kings Bay, Georgia.

Big contracts like those mentioned, heavy equipment spreads (Western's equipment replacement value totals over \$15 million), and employee ranks which swell to the 3,000-man mark in peak construction periods require close control of expenditures. Everist's company is no exception. This longtime construction man calls close management control and the daily, weekly, and monthly reports which

make that control possible "the crux of the construction industry."

Centralized control

Control of Western's entire operation is centralized in its Sioux City offices, where heads of the various departments — bidding, equipment, purchasing, etc.—keep a regular check on operations. These department heads spend the majority of their time away from the office, however, as this firm believes that regular visits to job sites are the only means of achieving accurate control. Payrolls are handled at the job level as a rule, but major purchases are always handled through the headquarters office.

Big equipment such as this heavy excavating firm uses doesn't usually



L. Garland Everist, secretary and general superintendent of Western.

sit around in an equipment yard, but is moved directly from one job to another. Western does have a storage yard, maintenance shop, and engine-rebuilding setup at Kansas City, Mo. This site was chosen for maintenance and service both because it is readily accessible by water, air, rail, or highway, and because many manufacturers have branch offices there. This latter fact contributes to faster procurement of parts.

Rebuilding and extensive overhauling of the big diesels that power Western's heavy equipment takes place at the Kansas City shop. Big over-the-highway transports bring these engines from the job sites regularly, so that a large force must be kept on hand to rebuild the engines and get them back to the job with

(Continued on next page)



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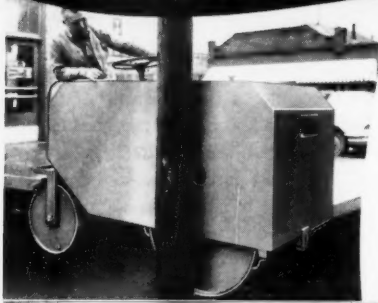
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Handiest 1-3 ton roller ever built!

Works within 1/2" of wall or post — eliminates much costly hand tamping.



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PFAHLER MFG. CO.
GALION, OHIO**

WEIGHS 1800 pounds empty and up to 6,000 pounds with ballast. Compacts to within 1/2" of wall on right side. Drive roll 30 1/2" dia. x 36" wide. Split steering roll 20 1/2" dia. x 30" wide. Single lever controls forward and reverse motion through constant mesh transmission — insuring smooth starts.

Contractors enthusiastic about economy and are coming back for more. Low, modern trailer available for hauling.

Write for detailed specifications and price!

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Select Earth Compaction Equipment Wisely

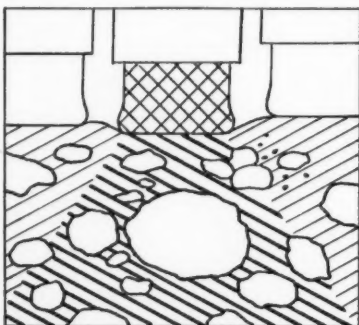
The right equipment assures a job well done at low cost.

Nothing is more important in compacting an earth fill than the proper selection of equipment well chosen; the right equipment produces modern density requirements of the engineer at relatively low cost to the contractor. In a few jobs, it is true, the earth can be used uncompacted. In others, the sheepfoot roller has a definite place; however, on the highest-type fills, the heavy duty rubber-tired compaction roller has demonstrated its outstanding ability to densify heavier lifts with fewer passes than any other equipment. In fact, the development of pneumatic rolling in the past 12 years has made it possible to build fills faster and far better than ever before.

That is why, in our mind, the heavy rubber-tired pneumatic compaction roller represents the greatest contribution to soil compaction in recent years. In 1932, contractors began to notice that loaded scrapers, far heavier than the "sheepfoot tamps" then in use, delivered high compaction in the area under the tires. The modern pneumatic compactor sprang from this basic observation.

COMPARING METHODS

The first direct comparison between the two types of rolling was made at Isabella Dam, Calif.: 42,000-pound



Southwest Rollers compact lifts 24" thick permitting rocks, cobbles to be incorporated in fill without removal.

sheepfoot rollers were used on the first dirt contract; pneumatics with 20,000 pounds of weight per wheel and 80 psi tire pressure on the second job. Twelve sheepfoot roller passes were made on 12-inch lifts on the first job. On the second contract, a Southwest C-50 Compactor made 6 passes on 18-inch lifts. In both cases, 70% of



Fill compaction achieved by sheepfoot roller and Southwest compaction roller. The substructure is 975 feet long and 95 feet from bedrock.

the tests went over 94% of Modified AASHO density. On this job, incidentally, a Southwest Giant Ripper was used for the first time to loosen and pre-wet the borrow pit.

Later, pneumatics also proved their ability where water was scarce—in dry desert sand on 2-inch lifts, they gave a fair degree of compaction under conditions considered almost impossible.

Because the Southwest Compaction Rollers generally will handle thicker lifts than a sheepfoot, rocks or cobbles can usually be incorporated into the fill without undergoing the expense of their removal. They will also compact a fill at a higher moisture content than a sheepfoot roller. The ponderous weight of their heavily loaded pneumatic tires overcomes pore pressures in the soil, squeezing some of the excess water up to the surface where it can evaporate. Furthermore, tests have shown that such a pneumatic-rolled fill has unusually good ability to shed rain water.

Engineers and construction authorities have concluded from tests that most earth-fills can be compacted by heavily loaded rubber-tired compaction rollers with about half the number of passes and for about half the cost of comparable results with the sheepfoot.

OBSELETE SPECIFICATIONS

The truth is that the superior performance of pneumatic rollers such as built by Southwest has made many specifications obsolete — specs which call for one roller for each 150 cubic yards of fill per hour hauled in. South-

For more facts, use Reader-Reply Card opposite page 18 and circle No. 497



Western's 30-inch suction dredge, powered by 11,000-hp diesel engines, is dubbed the "Western Chief". Parts for the floating giant were furnished by 26 different manufacturers.

(Continued from preceding page)

a minimum of delay.

Semi-permanent repair shops are set up on big jobs—like the Missouri River dam projects. Portable shops also are set up to handle repair and servicing of equipment used on the turnpike jobs. Hubert, Jr., as equipment superintendent, makes regular visits to all the company's jobs to see that performance is what it should be and that repairs are handled speedily.

Largest suction dredge

Speaking of equipment, Western has some unusual pieces in its lineup. They include a 30-inch suction dredge, the Western Chief, which is powered by diesel engines totalling 11,000 horsepower. This marine giant was the largest diesel-electric dredge in the world when it was built for the Sioux City firm. Twenty-six manufacturers furnished its component parts.

Western also purchased 30 of the first Euclid 50-ton end-dumps; it was, in fact, at the Sioux City firm's suggestion that Euclid brought out the mammoth hauling units. This close work with the manufacturer isn't in this case, either; Western has more than once worked with engineers of an equipment manufacturing firm in the planning of extra-heavy-duty excavating equipment.

Any listing of even the major pieces of equipment owned by Western would be exhaustive, but a quick look at the list shows 18 shovels of various types and capacities; some 75 heavy hauling units of various capacities; upwards of 50 tractors; about 25 scrapers; 40 compressors; and 45 assorted pieces of concrete-placing and finishing equipment.

The company's special equipment also includes concrete canal lining rigs, for Western has done an impressive amount of this type of work. These rigs include two diesel-electric trimmers, two diesel-electric concrete slip forms, and four finishing jumbos.

Right now the firm is working in four states: Indiana, Kansas, South Dakota and Georgia. In the past, it has constructed jobs in 23 of the 48 states, and has bid, though unsuccessfully, on overseas jobs. Because frequent visits by the executives to the job sites are considered an important part of Western's operation, the company already has 150,000 miles on its second executive plane, a five-passenger Cessna 310 twin-engine craft.

This continually growing construction company is the "baby" that Hubert Everist, Sr., handed over to

WRITE TODAY!

For illustrated folders on the finest compaction roller equipment developed to date.

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Construction Machinery Division
ALHAMBRA, CALIFORNIA

CONTRACTORS AND ENGINEERS

younger men to manage. He feels it was a smart move, both because it has operated even more efficiently under corporate supervision, and because the move has allowed him to enjoy his retirement while still active.

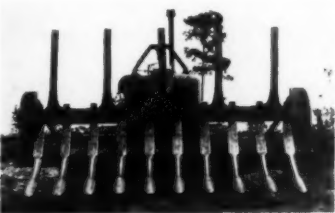
If the young Everists have the stuff that made their father a successful and highly respected contractor—and the years since his retirement seem to indicate they have—Western Contracting Corp. is going to continue to grow for a long time to come.

THE END

Case history

Clearing costs reduced more than 75 per cent

Discontented with the \$250 to \$350-per-acre cost of clearing several thousand acres of the Mesabi Iron Range near Hibbing, Minn., for strip mining, a large taconite mining com-



This Cat D8 with Fleco Rock Rake windrowed cut trees for burning at the rate of 1 1/4 to 1 1/2 acres an hour.

pany bought and used a combination of Fleco Treedozer and Rock Rakes mounted on Cat D8 tractors, and thereby shaved their clearing costs to \$75 per acre.

The area consisted of thick growth made up of small and medium-sized trees, and boulders ranging up to several tons in weight. Most of the boulders were half-buried and could not be seen through the thick growth. After downing the growth, it was necessary to windrow the waste and burn it.

The first team of Fleco-equipped tractors went to work clearing access roads into the area. As expected, the going was rough and slow. In spite of this, the Treedozer knocked down the growth in 10-foot swaths at the rate of 1 1/4 to 1 1/2 acres per hour. The Rock Rake-equipped D8's followed, windrowing the trees for burning at a 1 to 1 1/4-acre-per-hour rate.

For more information on these tractor attachments write to the Fleco Corp., 1375 W. Church St., Jacksonville, Fla., or use the Request Card at page 18. Circle No. 206.

Joint cutter

■ The Vibro-Joint cutter for preparation of contraction joints is featured in a bulletin from the company. The Model 25 is adjustable from 20 to 25-foot paving widths; the Model 12, from 12 to 13-foot widths. Job photos show the self-propelled, one-man operated unit in action. The entire machine is mounted on rubber-encased wheels. The step-by-step process of cutting is diagrammed.

To obtain this bulletin write to Vibro-Joint Co., Inc., 214 Commercial Bldg., Dallas 1, Texas, or use the Request Card at page 18. Circle No. 47.

Skid shovels

■ The Drott Four-In-One attachment for International tractors is described in a folder from the company. Action shots of the unit show it used as a skid-shovel, clamshell, bulldozer, and as a bullclam. By flicking the machine selector switch, the operator can convert the unit into any one of the four tools. The Hydro-Spring, diagrammed in the folder, is enclosed in the coil spring, and absorbs and cushions the impact loads. Also diagrammed is the special pry-out action of the loader.

To obtain Folder CR-405-F write to the Drott Mfg. Corp., 3841 W. Wisconsin Ave., Milwaukee 8, Wis., or use the Request Card at page 18. Circle No. 127.



"Snake-Style" wall for Omaha Auditorium grounds. Peter Kiewit & Sons, Omaha, Gen. Con.

Symons Forms on Serpentine Retaining Wall

Symons Forms were used exclusively to form this serpentine retaining wall which is 20 feet high at the highest point and slopes to 8 feet high at the lowest point. These walls were constructed to facilitate parking on the ground of Omaha, Nebraska's new city auditorium. Symons Forms were used for 30,000 square feet of forming on this job.

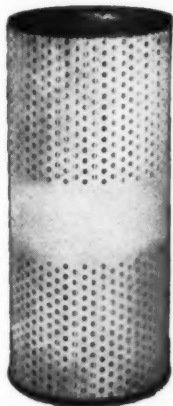
Send plans for your next job and get complete layout and cost sheet—no obligation. Catalog F-10 sent FREE upon request. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. F-6, Chicago 39, Illinois.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 498



103 drawbar horsepower is feature of new International TD-18A Diesel crawler.

What if dirty oil gets into the engine of a heavy-duty diesel like this?



A bearing can be worn seriously in a matter of hours if dirt-laden oil by-passes the filter and gets into a Diesel engine. This danger from by-passed, unfiltered oil is behind your International Harvester dealer-distributor's insistence that you use manufacturer-approved filter refills. He knows that they never get overloaded . . . never by-pass dangerous, dirty oil . . . never let harmful abrasives reach your engine. The reason is simple: they're built by Purolator to meet International Harvester's exacting requirements for every particular engine.

For the same reason, it pays to insist on manufacturer-approved filter refills for your Diesel. Its engine life depends on it.



PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada

For more facts, use Reader-Reply Card opposite page 18 and circle No. 499



PAVING OF A 2,200-FOOT-LONG, 28-inch-wide trench was completed in one morning by this trench-and-shoulder model of the Rola paver. The rig leaves no shoe or wheel marks to be raked out after the laydown operation. Trench-and-shoulder models of the paver are fully adjustable from the maximum 4 or 5-foot width down to a 1-foot minimum. Floating guides restrict the asphalt to the required width. For more details write to **Creative Metals Corp.**, 1290 Powell St., Emeryville, Calif., or use the Request Card at page 18. Circle No. 252.



Case history

Form life doubled by plastic sealer

The application of one coat of Technicote Formcote doubled the life of the forms used by the Horn Construction Co., Merrick, Long Island, N. Y., in constructing 70 piers for the Hudson County, N. J., extension of the New Jersey Turnpike, according to Roy Mattson, concrete superintendent for Horn on the \$4.5 million project. The average form on the job was used 20 times.

Specifications called for the monolithic forms to be oiled before each pour. To seal the plywood from both oil and water, a coat of Formcote was brushed on prior to erecting the forms



One coat of Technicote Formcote, brushed on the forms before each pour, is considered to have doubled the life of the plywood for the Horn Construction Co.'s pier job on the New Jersey Turnpike.

for each pour. The plastic compound prevented the absorption of oil and moisture so that the boards remained solid and light. There was no dark oil stain to mar the finished concrete, either.

The contractor's organization had expected no more than an average of 10 pours with each set of forms. The use of Formcote, therefore, was concluded to have doubled the life of the plywood.

For more information about Technicote Formcote write to L. J. Kissling & Son, P. O. Box 21, Long Island City, N. Y., or use the Request Card at page 18. Circle No. 183.

New tracing vellum for easier erasures

The Frederick Post Co. has announced an improved draftsman's tracing vellum featuring better erasability. Called Blutex, the product is actually a revised formulation of an established vellum.

According to the company, the easier erasing quality is due to a combination of transparentizing materials used in treating the base stock. Blutex is treated with 100 per cent synthetic resins rather than oils, and the resins are said to provide a "drier" working surface of unchanging characteristics.

The manufacturer also claims finer drawing characteristics for Blutex. The dry surface takes opaque graphite lines with unusual ease and uniformity, it is reported.

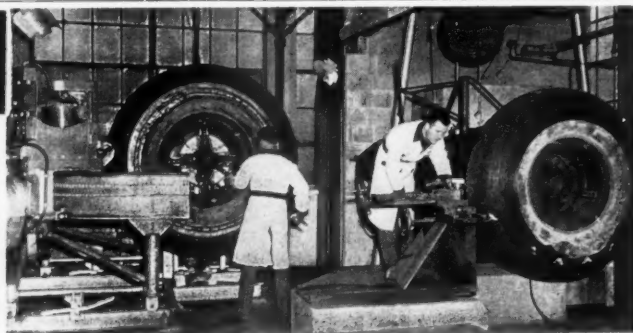
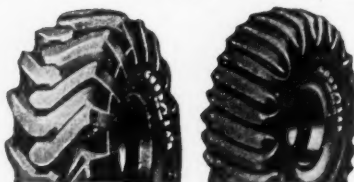
For further information write to the Frederick Post Co., 3666 N. Avondale Ave., Chicago 18, Ill., or use the Request Card at page 18. Circle No. 156.

Excavator-conveyors

DragScraper machines with capacities of from 1/3 to 3 cubic yards are featured in a catalog from the manufacturer, Sauerman Bros., Inc. Both standard and rapid-shifting machines are shown. Data also is given on track cable scraper machines and tower excavators units. Job photos show the machines working in sand, gravel, overburden, and other materials. Diagrams illustrate details of operation.

To obtain Catalog A write to Sauerman Bros., Inc., 616 S. 28th Ave., Bellwood, Ill., or use the Request Card at page 18. Circle No. 125.

CUT TIRE COSTS IN HALF



CAROLINA BIG TIRE SPECIALISTS can put deep, rugged treads on your worn, apparently worthless, earthmover tires to give them new-tire traction. You save more than half the cost of new tires, and you can depend on CAROLINA RETREADED TIRES to give service equal to and often better than new ones. CAROLINA GUARANTEES WORKMANSHIP AND MATERIAL.

FAMOUS CAROLINA TIRE SERVICE speeds specially-equipped trucks manned by trained operators to your job site, anywhere, around the clock, to save you costly "downtime". We ship tires throughout the country. We can also serve you through your regular tire dealer. Call him and specify CAROLINA TIRE RETREADS today.

AS EARTHMOVER TIRE SPECIALISTS we can handle your biggest tires ranging from 1100 x 24 up to 2700 x 33 and including 29.5 x 25 and 29 sizes. You can get GOODYEAR SURE GRIP, HARD ROCK LUG, or HARD ROCK RIB treads. "Special service" treads are also available for truck and pneumatic industrial tires.

CAROLINA TIRE COMPANY

232 N. MAIN ST.
SALISBURY, N. C.

SPECIALISTS IN EARTHMOVER TIRE RECAPPING, RETREADING, AND REPAIR

For more facts, use Reader-Reply Card opposite page 18 and circle No. 500

THREAD REPAIRS

Use this kit to cut downtime
• speed repair
• and salvage
• reduce component inventories



Heli-Coil Shop-packs provide a new method for on-the-spot, permanent repair of damaged threads. It's as easy as this...

Just drill out old fastening and/or female thread, retap with Heli-Coil Tap, wind in Heli-Coil Insert. In seconds, for pennies, you have original size, better-than-new threads.

Heli-Coil Inserts are made of diamond-shaped, coiled, stainless steel wire. They eliminate plugging, welding, going to larger bolts or studs. Many maintenance men install Heli-Coil Inserts at wear points on new equipment during first overhaul to prevent expensive downtime later.

Your distributor can supply you with handy Shop-pack Kits for repairing thread sizes 6-32 to 1 1/2-6 NC and 6-40 to 1 1/2-20 NF. (Available also for 14 mm spark plug threads.)

Write today for complete information, price list and name of your nearest Distributor.

*Reg. U.S. Pat. Off.

IN CANADA: W. R. WATKINS CO. LTD., 41 Kipling Ave. S., Toronto 18, Ont.

HELI-COIL CORPORATION

506 Shelter Rock Lane,
Danbury, Conn.

Please send Shop-pack Bulletin No. 724A.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

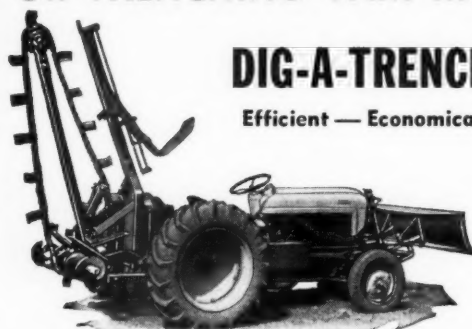
CITY _____ STATE _____

For more facts, use coupon or circle No. 501

CUT COSTS On TRENCHING With the

DIG-A-TRENCH

Efficient — Economical



Low Original Cost
Digs trenches up to 5 1/2 ft. deep, 7 1/2" or 10" wide.

Low Upkeep Cost
Plenty of speed—up to 500 ft. per hour.

Ditches for

- Utility Connections
- Water Lines
- Electrical Conduit
- Tiling
- Footings
- Septic Systems

— Anywhere a Trench Is Needed —

Mounts on Late Model Ford Tractor

Write for literature.

Manufactured by

The Mississippi Engineering Co., Inc.
Grand Mound, Iowa

For more facts, circle No. 502



All wheels on the Oshkosh Model 18-34 6 x 6 carrier are drive wheels, a feature which gives the carrier good traction over any ground.

Transit-mix carrier with all-wheel drive

■ A new all-wheel-drive transit-mixer carrier, the Oshkosh Model 18-34 6 x 6, is designed to carry mixers of 5½ yards or greater capacity.

The Model 18-34 6 x 6 provides weight distribution of 18,000 pounds on the front axle and 34,000 pounds on the rear axle. Power steering, as standard equipment, and a short wheelbase assure greater maneuverability in traffic, according to the manufacturer. Power on all three driving axles provides six-wheel-drive traction for on and off-highway hauling and spotting of loads, especially in rough ground conditions.

Features of the Model 18-34 6 x 6, in addition to its six-wheel drive, include a forward-cantilevered engine which permits easier servicing; front shock absorbers; ten speeds forward to meet all operating conditions; Bostrom "level-ride" operator's seat as standard equipment; and other comfort and safety features.

For further information write to the Oshkosh Motor Truck Co., 2300 Oregon St., Oshkosh, Wis., or use the Request Card at page 18. Circle No. 60.

2-TON CAPACITY 20-FT. CABLE LUG-ALL® Winch Hoist

Now! An all new 2-ton LUG-ALL Winch-Hoist with extra strength and reach to handle those heavier and longer lifting, lowering and pulling jobs with guaranteed safety. It has all of the construction and safety features made famous by LUG-ALL hoists, including a REVERSIBLE "Safety handle" that bends before the hoist is severely overloaded, and an interlocking pawl system that gives positive control. No brake or clutch to slip!



WEIGHS ONLY 15 lbs.
PRICED AT ONLY \$49.50 FOB Factory
QUALITY CONSTRUCTION
• STRUCTURAL TYPE PROTECTIVE FRAME
• HIGH STRENGTH FLEXIBLE AIRCRAFT CABLE
• ONLY TWO SPRINGS
• OILED-FOR-LIFE BEARINGS
Smaller LUG-ALLs from ¾-ton to 1½-ton capacity weighing 9 lbs. and less—for those hard-to-get-at jobs, also available. Write today for more information.
LUG-ALLS LIFT • PULL • LOWER • MOVE • STRETCH • TIGHTEN • STRAIGHTEN AND BEND AT ANY ANGLE
It's the Most Imitated Winch Hoist on the Market
THE LUG-ALL COMPANY
HAVERFORD 2, PA.

For more facts, circle No. 503

Weighted-bottom torches will burn up to 55 hours

■ The R. E. Dietz Co. offers three weighted-bottom highway torches that hold 110 ounces of kerosene each. Reportedly the largest-capacity torches on the market, they will burn up to 55 hours with one filling.

All torches in the Dietz line are of 20-gage steel; seams are tightly double-rolled and joints are cemented leakproof.

The unweighted, flat-base torch in the Dietz line features a weather-guard cam-lock burner that can be removed at the twist of the hand. It is held by a ring guard attached to the body of the torch so that the burner cannot be lost.

For further information write to



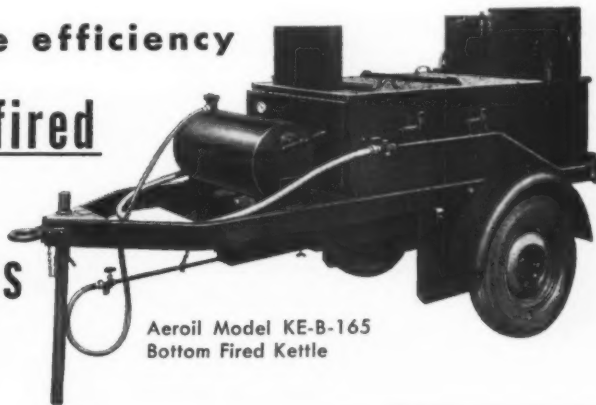
Dietz torches hold 110 ounces of kerosene and will burn up to 55 hours on one filling.

the R. E. Dietz Co., 225 Wilkinson St., Syracuse 1, N. Y., or use the Request Card that is bound in at page 18. Circle No. 111.

more economy...more efficiency

Aeroil bottom fired asphalt, tar, pitch melting kettles

FOR CONSTRUCTION
AND MAINTENANCE



Aeroil Model KE-B-165
Bottom Fired Kettle

more economy!

Twin economy is yours with every Aeroil melting kettle! Save on initial cost thanks to Aeroil's mass production manufacturing methods. Save on operating costs with proven "wrap-around heat flow" design that instantly spreads 2000°F. direct heat for fast action, no wasted time. Plus many more engineered-in economy features!

more efficiency!

Be sure of more melting kettle efficiency by selecting the exact kettle to fit your specific needs. Whatever the job, an Aeroil standard model or one custom-built to bid specifications will insure more efficiency with year after year of trouble-free service!

more product features!

Since 1917, Aeroil has designed and developed the kind of melting kettles construction companies and maintenance departments want and need! Here's a tally of some of the features that are yours today: choice of firing (LPG or Oil) . . . choice of mounting (pneumatic tires, skids, hard rubber or steel wheels) . . . full selection of types and sizes . . . and many, many more advanced-engineered features that are backed by an unconditional one year guarantee!

Attention Officials, Engineers, Contractors: Send coupon for useful product literature.

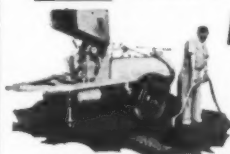
Aeroil Products Company, inc.

69 WESLEY STREET, SOUTH HACKENSACK, NEW JERSEY
Branch Offices: LOS ANGELES and CHICAGO

"Quality Guaranteed Products Since 1917"

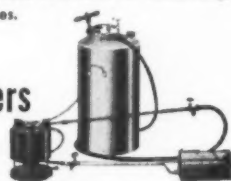
Melting Kettles • Melting Furnaces and Compound Pots • Tool Trailers • Torches and Burners • Concrete, Tool, Space, Water Heaters • Coating, Cleaning, Finishing Hot Dip Tanks • Roofers and Pavers Accessories

MORE TIME AND MONEY-SAVING AEROIL EQUIPMENT



sprayers

CUT-BACK SPRAYERS that permit one-man penetrating, patch or shoulder work. POWER DRIVEN SPRAYERS AND EMULSION SPRAYERS for rapid, economical application of materials direct from shipping drum. Recommended for all light liquids normally used in construction and maintenance having a maximum viscosity of 115 furl at 77°F. POWER AND HAND SPRAY ATTACHMENTS to fit any make melting kettle. PORTABLE SPRAYERS for disinfecting, weed killing and other similar chores.



torches and burners

HEAVY-DUTY TORCH OR BURNER OUTFITS for economical, instant heating of oil-fired kettles. PORTABLE TORCHES for thawing, heating equipment and tools as well as scores of general uses in the field. COMBINATION PORTABLE TORCH-SPRAY OUTFITS.

plus "HEAT-MASTER" KETTLES with exclusive patented heat riser • "TOOL-MASTER" TOOL TRAILERS • TOOL-HEATING EQUIPMENT • PAVERS ACCESSORIES

FILL OUT AND MAIL NOW!

Aeroil Products Company 656
Dept. CE, 69 Wesley St., South Hackensack, N. J.
Please send me your literature on:

☐ melting kettles ☐ sprayers
☐ torches and burners ☐ other: (.....)

Name.....Title.....
Company.....
Address.....
City.....County.....State.....

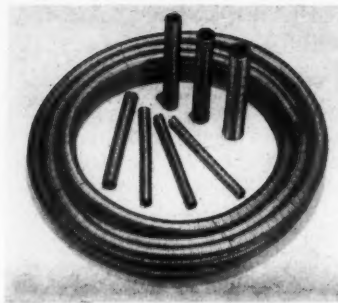
For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 504

Lightweight metal tubing for construction ducts

■ Titeflex, Inc., has announced a new type of lightweight, low-cost metal tubing said to be particularly useful for ducts in the construction field.

The external ridges of the tube are said to give it a good grip in concrete, and the helical ridges make it stiff enough so it can be securely positioned inside concrete forms with a minimum of supports or anchorages.

According to the manufacturer, Titeflex 500 tubing has already found its greatest application as the ducting for housing the stressing cables in prestressed concrete, both because of its good anchorage to the concrete provided by the outside ridges and because of the smooth inside bore,



which latter feature makes it easy to run in the cables and permits easy flow of grout. Also, the lead coating on the interior of the tube facilitates sliding of stress bars into the tube—particularly the last one or two cables to fill the tube.

The new tubing is already available in a series of seven sizes from 7/8-inch ID to 2-inch ID. Weight runs from 0.11 pound per foot for the 7/8-inch size to 0.26 pound per foot for the 2-inch tubing.

For further information write to Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J., or use the Request Card at page 18. Circle No. 59.

Low-bed trailers

■ Dorsey Model HTS low-bed trailers for hauling shovels or tractors are described in a folder from the company. Available in 15 to 35-ton capacities, the trailers are equipped with a flat-type gooseneck, and gooseneck ramps for motor graders are optional. Diagrams of level deck and 6-inch drop-deck trailers are given along with the specification tables.

To obtain this folder write to Dorsey Trailers, Elba, Ala., or use the Request Card at page 18. Circle No. 16.

Hoist or pull unit

■ The Tirfor hoist or pull unit for erecting framework, removing piling, tightening guy wires, loading and unloading heavy machinery, and other jobs is described in a folder from the manufacturer, Princeton Griphoist, Inc. The one-man operated unit, weighing 42 pounds, can pull or lift loads up to 3,300 pounds, according to the folder. With the addition of tackle blocks it can handle loads up to 6 tons. Job photos and specification data are included.

To obtain this folder write to Princeton Griphoist, Inc., 32 George St., Boston 19, Mass., or use the Request Card at page 18. Circle No. 26.

Gasoline, diesel engines

■ Four bulletins describe the engineering and design data on gasoline overhead valve and direct-injection diesel engines made by Hercules Motors Corp. Each bulletin includes the basic installation diagram, a power chart, specifications, and general data on each model. The interchangeable gasoline and diesel engines come in 4 or 6 cylinder sizes.

To obtain Bulletins E-301, E-302, E-303, and E-304 write to Hercules Motors Corp., Market and E. 11th St., Canton 2, Ohio, or use the Request Card at page 18. Circle No. 17.

Truck service guide

■ An Ingersoll-Rand catalog compares truck-service shop time and costs for common manual service jobs and time and costs for jobs done with air and electric power tools. The same operation was performed with a hand tool, and again with the Impactool. Cost evaluations are given on axle jobs, oil-seal renewals, valve grinding, differential and transmission overhauls, and piston and main-bearing renewals. Case histories treat the use of Impactools for wheel changing, replacement of spring U-bolts, and maintenance of bulldozers. Each tool used in the operations is pictured, and specifications and capacities are given.

To obtain Form 5097-10 write to

Ingersoll-Rand Co., 11 Broadway, New York, N. Y., or use the Request Card at page 18. Circle No. 121.

Data on transit

■ The Keuffel & Esser Co.'s Paragon transit is featured in a folder from the company. The fully achromatic optical system brings the entire field into focus, according to the bulletin. Since the telescope is internal focusing, the objective lens is also stationary. The telescope is sealed at both ends, and the barrel is practically dust and moisture-proof. Complete specifications of the transit are given.

To obtain the bulletin write to Keuffel & Esser Co., Adams and 3rd Streets, Hoboken, N. J., or use the Request Card at page 18. Circle No. 133.

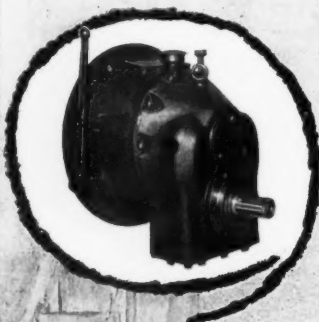
Longer
Work Time
Keeps Your
Profits...UP

with

**S-N
REDUCTION
GEARS**

POWER A DIESEL OR
GASOLINE INDUSTRIAL ENGINE
with S-N REDUCTION GEARS
and Power Cut-Off Clutch

Regardless of the type of heavy duty equipment you are powering... there's a S-N Model and gear ratio to do the job—faster, and more economically. Seven models available. Remember S-N Reduction Gear Units insure smooth, full power from engine to load with maximum economy. Ideal for original equipment and all types of engines from 40 H. P. to 750 H. P. giants. Reduction ratios start at 1.5:1 and step-up to 4:1 in standard ratios. New catalog sheets are available.



SNOW-NABSTEDT
Transmission Engineers
FOR HALF A CENTURY
INDUSTRIAL DIVISION
THE SNOW-NABSTEDT GEAR CORP. HANSEN, CONN.
1975 YEARS OF BETTER GEAR

For more facts, circle No. 505

FOR
EFFICIENCY
and
ECONOMY...

2 WAYS TO
MAKE
CRANE OPERATIONS
PAY MORE



1 RUD-o-MATIC Combination Magnet Reel-Tagline

Rud-o-Matic Combination Magnet Reel-Tagline saves expensive electric cable wear on overhead and boom crane jobs. Tension on the steel tagline cable keeps the strain from the expensive electric magnet cable. Now standard equipment with major crane manufacturers, the Rud-o-Matic Combination Magnet Reel-Tagline is made in five models to fit your present equipment. Insure complete tagline control on your crane with Rud-o-Matic!



2 RUD-o-MATIC Tagline

Crane operations are more profitable when you install Rud-o-Matic Taglines. Heavy duty torsion coil spring keeps tension on tagline cable at all times for bucket control. Buckets are held steady at any angle of the boom. Available in 11 models for various bucket sizes and pull out requirements. Taglines delivered fully equipped with fairlead and cable attached—ready to install. Get more pay loads per day with your crane with Rud-o-Matic Tagline Control!

For full information on Rud-o-Matic Taglines, call or write—

**McCAFFREY-RUDDOCK
TAGLINE CORP.**
2131 E. 25th St. • Los Angeles 11, Calif.

For more facts, circle No. 506

MEASURE
DRILLING
SAVINGS

by
the
foot*



**McCARTHY
NEW HEAVY-DUTY
VERTICAL AUGER DRILL**

*Strip Miner Drills 8-1/2" Blast Holes 60 Ft. Deep in 1 Hour, Including Moving Time.

Savings, like costs, are measured by the foot, especially in tough earth and rock formations. Using the new McCarthy 106-24 Vertical Drill, this Pennsylvania strip miner cut drilling time to 1 hr. per hole (including moving time) on 60-ft. blast holes 8 1/2" in diameter. Formation was 20 ft. of soft top strata, 35 ft. sandstone and 5 ft. of hard sandstone and bastard limestone.

A new speed reducer on Model 106-24 slows auger rotation for drilling harder rock formations. The result is more torque, or "biting power." You have fewer bit failures, cutting over-all drilling time. Driller above used tungsten carbide bits.

The McCarthy Model 106-24—"World's Fastest Heavy-Duty Vertical Auger Drill"—handles augers from 3" to 24" in diameter.

Write for Bulletin M-100

THE SALEM TOOL CO.
S. ELLSWORTH AVE.
SALEM, OHIO • U. S. A.

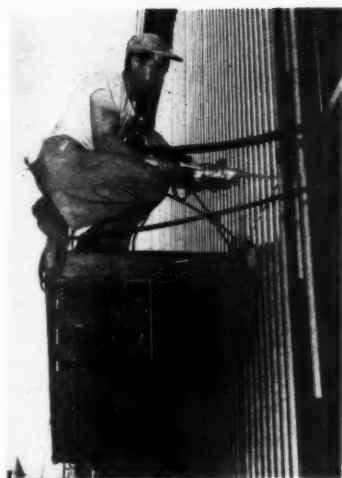
For more facts, circle No. 507

CONTRACTORS AND ENGINEERS

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Using a Black & Decker impact wrench, a workman drives self-tapping stainless-steel screws into place to erect an aluminum and cellular-glass sandwich wall.

Case history

Glass-insulated wall is economical, flexible

An aluminum and cellular-glass sandwich wall 3½ inches thick is being used in the construction of the new bottling plant of the Duquesne Brewing Co. in Pittsburgh, Pa. The erection contractor is Elwin G. Smith, Emsworth, Pa.

In addition to substantial savings in cost and time, use of this type of wall construction provides extreme flexibility. An outer wall can be pulled down, new structural work erected, and the dismantled wall replaced on the extended section. Also, large pieces of machinery can be moved in and out of the building by dismantling

a wall and reassembling it after the equipment has been moved.

The walls are constructed on the site. The back-up sheet of aluminum-ribbed industrial siding is set in place against supporting members, and holes are drilled through the valley of the ribbed sheet and the steel support. Drives screws are driven to hold the back-up sheet in place. Foamglas blocks, 1½ inches thick, are then placed against the back-up strip and temporarily secured with an adhesive.

The facing sheet is set in place over the insulation and holes are drilled completely through it, the insulation, the back-up sheet, and steel supporting members. The holes are spaced 8 inches on centers. In finishing the wall, the complete panel is fastened with stainless steel, self-tapping screws which have neoprene and aluminum washers integral with the screw.

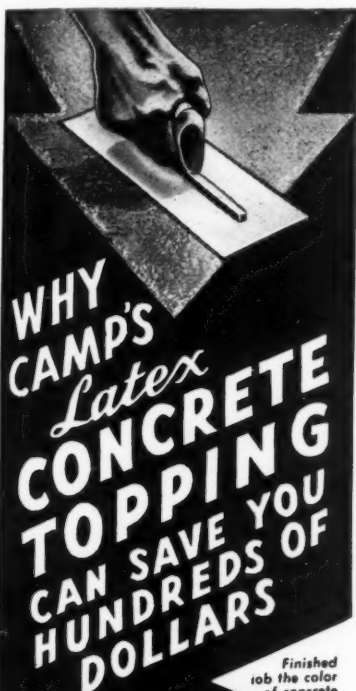
Foamglas, manufactured by the Pittsburgh Corning Corp., was chosen for the insulation because its structure of sealed glass cells is impervious to moisture. In addition, its rigidity and strength produces a strong panel section.

For further information on Foamglas insulation write to the Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 204.

Hydraulic starter

■ The Hydrostarter, a hydraulic starter designed specifically for diesel engines, is highlighted in a bulletin from the manufacturer. Unaffected by low temperatures, the unit has a static torque of 80 foot-pounds at 3,000 psi working pressure. The folder states that the explosion-free starter is adaptable for diesels up to 500 horsepower. Positive pinion engagement is explained, and operation and installation details accompany a diagram of the entire unit.

To obtain the folder write to Aero-products Operations, Allison Division of General Motors Corp., Municipal Airport, Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 38.



WHY CAMP'S Latex CONCRETE TOPPING CAN SAVE YOU HUNDREDS OF DOLLARS

- ✓ 1/16" to 1" of Latex Concrete Topping will recondition or repair any stable concrete surface, NEW or OLD.
- ✓ Perfect for smoothing or patching rough, spalling, broom-marked, pitted, uneven or broken concrete.
- ✓ Easy to apply—Easy to work. Self banding. Eliminates curing necessary with regular concrete.
- ✓ Waterproof, highly resistant to grease, oil, lactic and other acids.
- ✓ Ideal for driveways, sidewalks, trucking aisles, swimming pools, basement floors, masonry, walls, etc. Provides resilient underfooting.
- ✓ Saves homeowners, factories, institutions hundreds of dollars in concrete replacement and repairs.
- ✓ Coverage approximately 100 sq. ft. 1/16" thick. For patching, enough to repair 50 to 100 holes depending on size and depth.



The CAMP Company, Inc.
Floor Specialists
6958 South State Street, Dept. CE-66
Chicago 21, Illinois

Finished job the color of concrete

Can be applied in direct sunlight without powdering

The solution to that frozen concrete floor.

Use inside or outdoors.

Bonds to any clean masonry surface.

Absolute satisfaction guaranteed.

Choice Dealer territory available.



NEW SUPERIOR PIPE BOOM

Model PPI-142—Represents the latest in Superior Pipe Boom design—matching International's latest models in the famed TD-14 size. Other model booms to match other size tractors. Sold through all International-Harvester dealers at home and abroad.

NEW OPERATOR COMFORT

All controls within easy reach—horizontally swinging for more restful handling. Seat is adjustable—vision less obstructed. All makes for less operator fatigue—greater efficiency.

FOR YOUR COMPLETE PIPE-LAYING NEEDS:

Quality Pipe Tongs • Welding Clamps • Pipe Dollies • Erection Booms • Swing Cranes • Blade Backfillers

Superior EQUIPMENT CO.
BUCYRUS, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 509

Build Better Roads Faster at Lower Cost

DUO

DUO-PACTION builds better roads through more uniform, more firmly consolidated roadbed aggregates without change of grade or surface level. You build faster because you can get greater coverage, with fewer passes, in less time than with conventional methods.



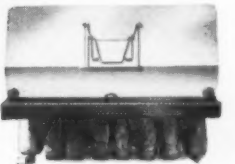
DUO-PACTOR steel and rubber rolls, operating alternately or together, produce aggregate base of higher density and greater stability than with either pneumatic or steel alone.



Pneumatics down, steel up for conventional rubber rolling. Large diameter front drive rolls are non-tracking with rear rolls . . . no increase in depth of grooves.



Pneumatics up, steel roll down, flattens out the ridges without disturbing aggregate base. No need for another roller.



Torsion spring deflection of gang roll provides higher loading on ridges, leveling out compacted surface.

Swing-Bar DISTRIBUTOR

Positive rate of bitumen application . . . no lean spots at starting line; no dripping after shut-off provided by quick-opening and closing exclusive Air-Snap spray bar.



SEAMAN-GUNNISON CORPORATION
Baraboo, Wisconsin

Send full information on:
☐ Duo-Pactor ☐ Distributor

Name _____
Address _____

by SEAMAN-GUNNISON

For more facts, use coupon, or circle No. 510

For more facts, circle No. 508

Case history

Air drill rotary bit bores concrete faster

A Kansas City firm was able to do its job 20 times faster when it switched to an Ingersoll-Rand air drill for cutting 5-inch-diameter holes through 5-inch-thick concrete. The drill was used in conjunction with a Tilden KonKrete Kore rotary bit.

Before switching to the air drill, a chipping hammer was used on the job. Not only did it require an hour to do each hole, but more time was needed afterwards to patch the ragged edges left by the chipping.

When an I-R 3SM air drill was put on the job with the Tilden bit, a clean hole which required no patching was

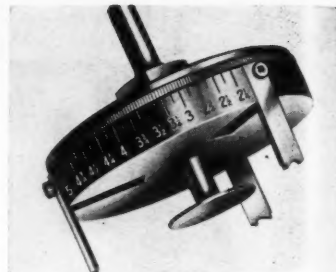


◀ An I-R 3SM air drill with a Tilden KonKrete rotary bit cut holes in concrete 20 times faster than a chipping hammer which was previously used.

drilled in only 3 minutes.

For more information on the air drill write to the Ingersoll-Rand Co., Phillipsburg, N. J., or use the Request Card at page 18. Circle No. 185.

The Model 500 Dial saw with push-out plug attached. Pilot drill can also be attached to cutting to twice the depth of the blade. ▶



New model of saw cuts 5-inch-diameter holes

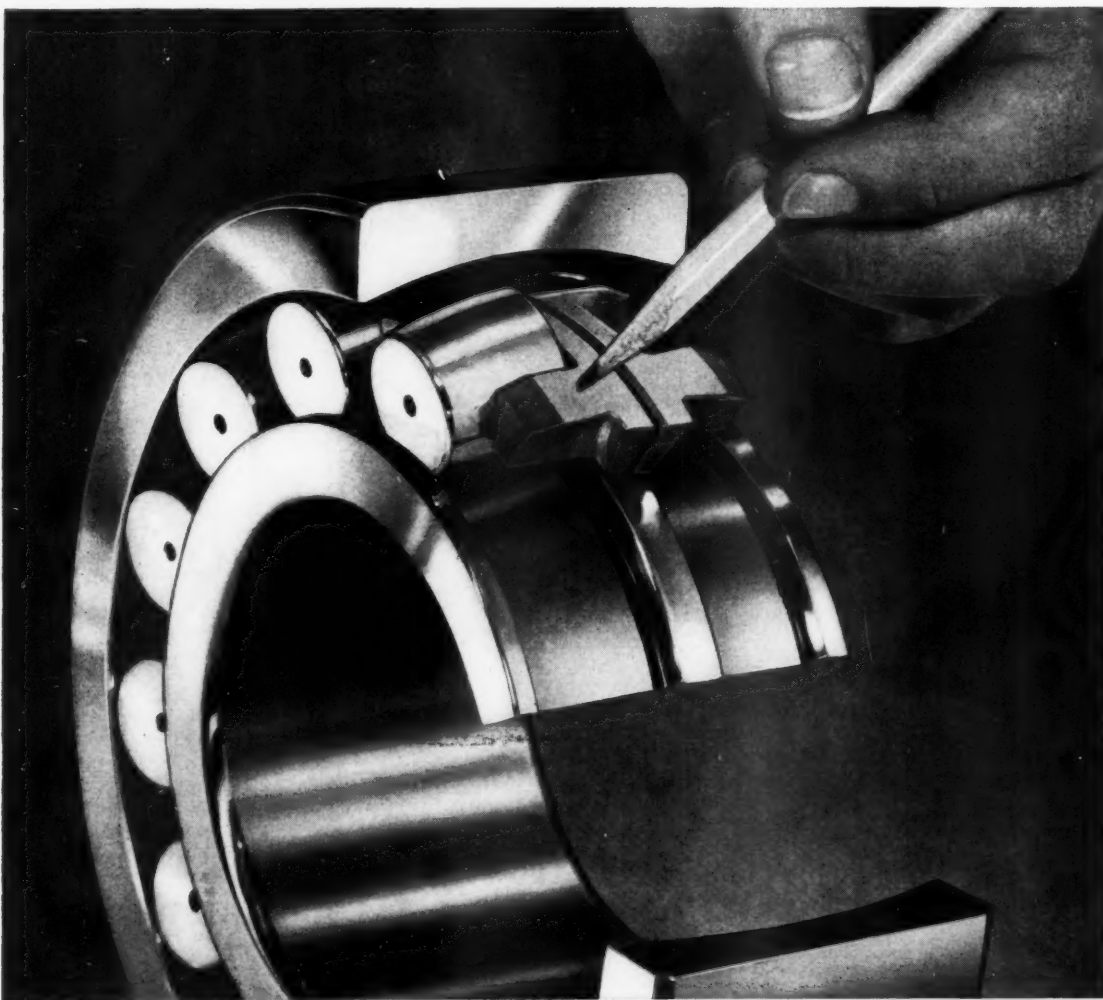
■ A new model of the Dial saw that will cut holes up to 5 inches in diameter in woods, metals, plastics, and other solids is now available from the manufacturer, Robertson & Ruth. Designed for use with heavy-duty equipment, the new model uses the same dial principal as the smaller Models 250, 375, and 400. It has been designated the Model 500.

At the turn of a calibrated dial, the three cutting blades are set for the desired diameter. Two sets of blades are supplied, one set with a cutting depth of 1½ inches for wood, and another with a cutting depth of 1¼ inches for metal. Material up to twice the depth of the blades may be cut by means of the ½-inch pilot drill furnished with each saw. By means of the drill, the work can be turned over and the cut from the other side can be accurately aligned with the first cut.

The Model 500 comes with a ½-inch straight shank, the Model 500A has a ¾-inch straight shank, and the Model 501 has a Morse No. 2 taper shank. The saw is made from high-alloy steel and can cut a minimum diameter of 2¼ inches.

For further information write to Robertson & Ruth, Dial Saw Division, P. O. Box 534, Elmhurst, Ill., or use the Request Card at page 18. Circle No. 96.

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Land-riding cages for longer life!

These fully machined cast-bronze, land-riding cages—one for each path of rollers—are important performance builders in TORRINGTON's Spherical Roller Bearings. The one-piece retainers keep the rollers perfectly aligned at all times, even under conditions of shock load and sustained speeds. Lubrication is more effective, too, as the lubricant has easy access to vital points of contact between rollers and races.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 511



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For more facts, circle No. 512

CONTRACTORS AND ENGINEERS

Backhoe, backfill-blade combination announced

■ A combination backhoe and backfill-blade attachment for the International 300 tractor has been announced by the Wain-Roy Corp. The combination reportedly is engineered to handle a variety of trenching jobs, bell hole and foundation excavation, and backfilling, leveling, and grading work.

Both attachments are fitted to a subframe, providing a sturdy mounting which, together with self-leveling hydraulic stabilizers, is said to relieve the tractor itself of heavy loads. The hoe is a complete, self-contained unit and can be removed or mounted in less than 30 minutes. Only four pins and two hoses need be attached before the combination blade is ready

to go into operation.

The effective digging depth of the hoe is 11 feet, and it is able to dig and dump in a 190-degree radius. The boom and dipper stick are heavy welded box sections shaped for the best load distribution. A crowd cylinder provides digging power, plus high-speed retraction.

On the forward end of the subframe, a 6-foot backfill blade is mounted. This blade raises and lowers hydraulically a distance of 18 inches above the grade to 8 inches below grade.

For further information write to the Wain-Roy Corp., Hubbardston, Mass., or use the Request Card at page 18. Circle No. 98.



All Armstrong trailers are equipped with a set of loading skids and stools, shown stored along the top of the gooseneck mounting.

Heavy-duty trailers handle 40-ton loads

■ Heavy-duty trailers that will haul in excess of 40 tons safely and efficiently are manufactured by J. D. Armstrong Heavy Hauling, Inc. The trailers feature spring-mounted tandem axles which are said to reduce drag on the axle and the wheel assembly.

The trailers' tandem wheels are in line with the truck-tractor duals, providing easier pull and roll for economy on cross-country hauling.

The standard-mounting gooseneck fits any standard fifth wheel.

Every rig includes a set of loading skids and stools. The standard models are equipped with Westinghouse straight air brakes; vacuum or combination-type brakes are optional.

For further information write to J. D. Armstrong Heavy Hauling, Inc., Box 307, Ames, Iowa, or use the Request Card that is bound in at page 18. Circle No. 178.



◀ The Wain-Roy combination blade can handle a variety of operations.

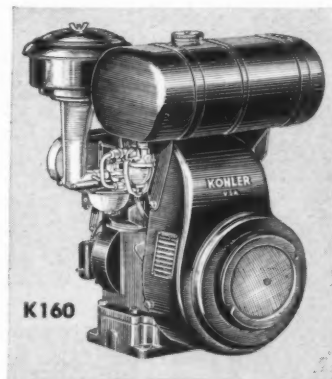
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K90



K160

Modern design, air-cooled Kohler Engines in sizes from 2.5 to 26 H.P. offer a power range to fit all applications requiring a reliable and economical power source.

Kohler branch offices are located in sixteen principal cities. Sales and service distributors, throughout the country, have parts available, are ready to assist you in selecting a Kohler Engine best suited for your requirements. Write for information.



K330



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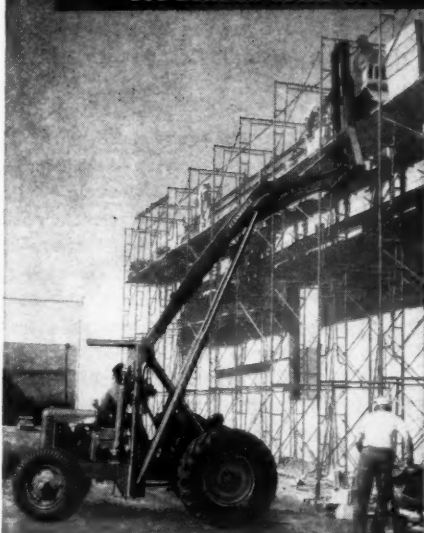
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PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 514

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The ECONMOBILE has a reach of up to 6 feet from wheel to heel of the pallet fork or auxiliary tower. That means you can easily move your material up and over the scaffolding as well as obstructions.

The ECONMOBILE has these other outstanding features: Hoisting height up to 22'; built-in ruggedness; power; stability; versatility; mobility; maneuverability; traction and flotation.

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4310 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

For more facts, use Reader-Reply Card opposite page 18 and circle No. 513



Working on the African coast near Tripoli, Crowe-Steers-Shepherd crews place a 12-inch-diameter pipeline which will carry gasoline and jet fuel from offshore tankers to the Wheelus Air Force Base. A Lorain 15-ton truck crane and a tractor-mounted crane handle the pipe.



High cost of labor?

Not in Libya, where an American joint-venture firm pays unskilled workers a maximum of one dollar a day

Eighty-five cents to a dollar a day for unskilled workmen? Two dollars a day for skilled laborers? Sounds like a contractor's dream, doesn't it?

In the United States, with its high-cost-in-the-world standard of living, such wages could only be an employer's dream. But in Tripoli, where a \$63 million air force base is nearing completion, they are the average wages being paid by the joint-venture firm of American contractors building this overseas military installation.

Lest the reader suspect some exploitation of the worker here, it should be pointed out at the outset that these wage scales are set by the Libyan government; the Crowe-Steers-Shepherd venture had nothing to do with deciding them.

Still sounds like a contractor's dream?

Well, Paul W. Downey, resident director of the Wheelus Field job for the joint venture, admits that labor isn't the premium on this project that it is on nearly every American job. But he advises that contractors who hire native labor on overseas jobs must exercise a healthy amount of patience in training the workers in American construction methods.

All in all, Downey had a very satisfactory report on the labor situation to make when he returned to this country recently to report on the Tripoli job to his employers—William L. Crowe Construction Co. and J. Rich Steers, Inc., both of New York City, and the Shepherd Construction Co., Atlanta, Ga.

Train native labor

Five years ago, when the joint-venture contractors started the Wheelus Field job, Downey took 324 Americans with various construction and administrative skills onto the job with him. These experienced workers set about training the native labor on the job. It was here that the patience was required.

"We have found that the Libyans are excellent workers if they are trained with patience and if their work is sufficiently sectionalized," the resident director reports. "With the exception of a few who were trained in masonry work, most of these workers were completely without construction experience—and we had to start them from scratch. It was a matter of breaking down the jobs so

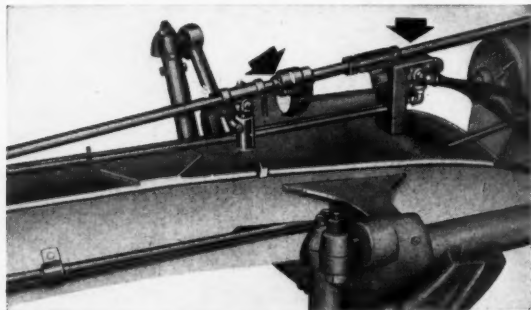
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Get complete facts about Rivinius Power Steering and Moldboard Shift from your Caterpillar dealer . . . or write:

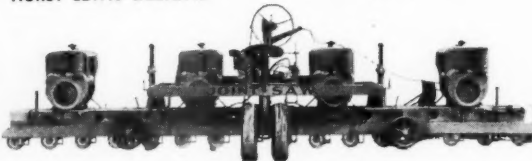
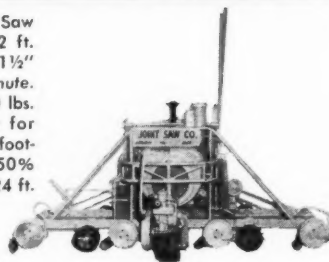
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New Available: 12 ft.—24 ft.—25 ft. Heavy Duty Saws with 4 to 16 blades.

SAVE UP TO 80% OF LABOR AND TIME in setting up and stripping forms by renting our JOINT SAW SPRING CLIP TIE-BAR FASTENERS. These Fasteners will do A BETTER JOB FOR A LOT LESS MONEY.

SAVE MONEY TWO WAYS—by Renting and Using equipment that does the job BETTER FOR LESS

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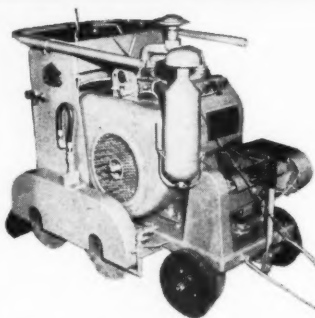
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THE CONCRETE SAWS THAT DEFY COMPETITION



Model
SUPER S-T-T
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HEAVY DUTY
"STEP
CUTTING SAW"

Powered by 25 H.P. Engine.
Blade Guard Capacity: 2—14" Blades and 4" cutting, or 1—24" Blade and 8" cutting optional.

The Concrete Cutting Saw without equal for speed and economy. Cuts nearly TWICE AS FAST as single blade machines—reducing man-hours accordingly. Gives longer blade life—for greater economy.



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For more facts, circle No. 517



Paul W. Downey, resident director of the Wheelus Field job for Crowe-Steers-Shepherd, points out a phase of the \$63-million job on a photo of the site at the Crowe company offices in New York City.

that they didn't have to absorb too much at one time."

Progress on the job wasn't anything impressive during those early months of training, Downey admits, but little by little the pace picked up as the laborers learned their particular jobs. Since then, many have made considerable progress, and today there are native workers holding foremen's jobs and even higher supervisory positions. About 30 are earning \$124 a month—a handsome wage in Libya.

Although these workers do have labor organizations based somewhat on the old guild idea, all negotiations over wages are conducted directly with the government. The 48-hour work week is standard in Libya, as well as the daily wages quoted at the beginning of this article.

This direct negotiation with the government on wages is important on jobs like this, for if a foreign employer attempts to pay wages higher than those going, he may cause serious harm both to the nation's economy and to worker morale generally.

The Crowe-Steers-Shepherd employees on this project have workmen's compensation benefits roughly equivalent to those in effect in this country. Most live in the nearby city of Tripoli, so there is no problem of housing accommodations. Busses operated by the contractor pick the workers up in the morning and bring them out to the job site (a distance of about seven miles), and return them to the city after the work day is over.

A continuing safety program is in effect on the project, and Downey reports that the native workers cooperate well with the management's efforts to avoid accidents.

Unusual work

In this unusual situation, material costs are far more of a premium than labor costs; consequently, some reversals in American procedures are inevitable. For example, the steel in old reinforced-concrete buildings has been salvaged ("cleaned until you can't tell it from new steel") and re-used on occasion. In this country, it wouldn't pay a contractor to put high-priced labor to work on this time-consuming job.

Maintenance is an important part
(Concluded on next page)

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These long lengths are always ahead of the job—because American-Marietta Company's many up-to-date facilities, strategically located throughout the country, assure prompt and regular deliveries. Long lengths speed installation, too, by reducing handling and joint making. Built-in smoothness of *unquestioned permanence* provides sustained high flow capacity—cuts operation and maintenance costs.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 519

(Continued from preceding page)

of this desert job, as blowing sand contributes to the downtime of machinery. Crowe-Steers-Shepherd has had as many as 100 men on maintenance and repair duty at peak construction periods. Just now, 40 native workers and four Americans handle the maintenance work.

While 40 per cent of the materials being used on the project were purchased overseas, virtually all the machinery was bought in this country and shipped over. Again with some patience, American operators and maintenance men have trained native workers to work easily with Cater-

pillar tractors, Lorain cranes, Le-Tourneau-Westinghouse Turnapulls, Cedarapids crushing equipment, Bucyrus-Erie shovels, Barber-Greene paving and finishing machines, and other well-known American equipment.

Most of the Libyan workers have picked up enough English to understand instructions and communicate with their American supervisors, so the language difference presents no problem, Downey says.

This joint venture feels, too, that it is making a contribution to Libya as a nation. "We will leave a better trained populace when we pull out," Downey declares, "and in leaving them this know-how we are helping them to help themselves. THE END

Hydraulic canal dredge

■ Dragon Model hydraulic canal dredges in 6, 8, 10, and 12-inch sizes are featured in a catalog from the manufacturer, Ellicott Machine Corp. Designed for use in narrow, shallow canals and small inland waterways, the dredges can also be operated as conventional pipeline dredges with the ladder in fixed position and pivoting on the rear spuds. According to the catalog, all of the dredges can dig their own flotation, and their low superstructure permits passing under bridges and into places formerly inaccessible to hydraulic dredges.

The cutter and supporting ladder move independently of the hull, and as a result of this the 6 and 8-inch dredges can work in a 13-foot wide channel. The hydraulically-controlled spuds "walk" the canal dredge forward in a straight line, or permit side positioning action. The basic power source is a diesel engine, but, as a diagrammatic picture points out, individual motors drive the cutter and the spud hoisting winches. Separate hydraulic cylinders position the ladder and the discharge pipe. The basket-type cutterhead pictured has six spiral blades.

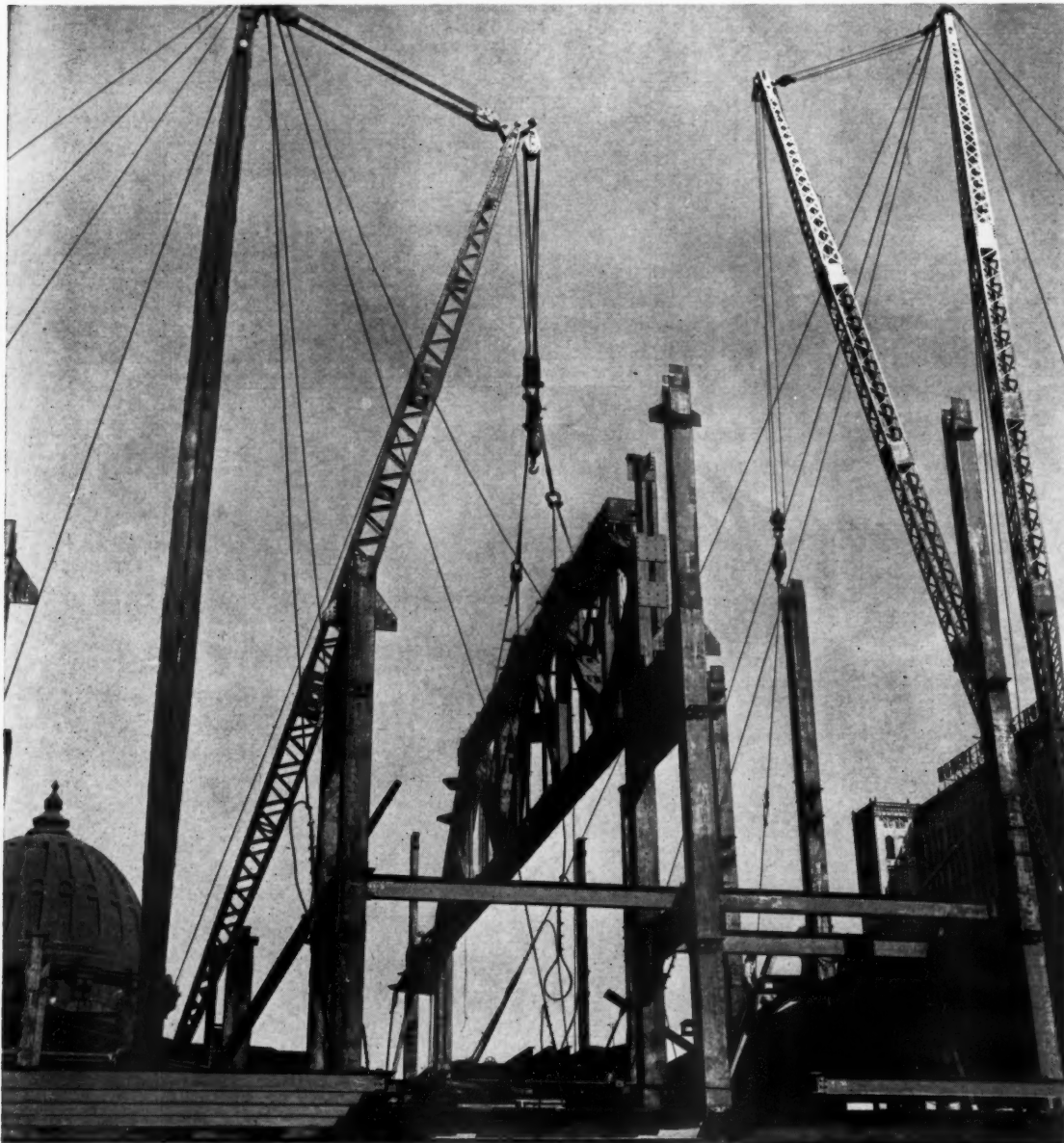
Job photos show that the canal dredge can ride on a ship or barge if water transportation is available. However, the dredge is designed to be carried on a low-bed trailer without disassembly. Another job photo shows the unit set into position by a crane. Complete specifications are given on the dredges.

To obtain Bulletin 850 write to Ellicott Machine Corp., 1611 Bush St., Baltimore 30, Md., or use the Request Card at page 18. Circle No. 129.

Direct-drive chain saw

■ A 19-pound direct-drive chain saw that operates on a 5-hp gasoline engine is featured in a folder from the manufacturer, Homelite. Job photos show men felling trees up to 3 feet in diameter. Parts of the unit pictured in detail are the sprocket-mounted crankshaft, short-stroke engine pistons, air filter, and automatic governor.

To obtain this folder write to Homelite, 71 Riverdale Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 135.



Architects for new Sheraton Hotel: Perry, Shaw, Hepburn and Dean, Boston; Structural Engineer: Maurice A. Reidy, Boston; General Contractor: McCloskey and Co., Philadelphia

Wire Rope at Work—Philadelphians are soon to have a great new hotel—the Sheraton. A 22-story building with de luxe features from lobby to roof, the Sheraton will be a unit of Penn Center, in the very heart of the city. It is to cost approximately \$14,000,000.

Here is a picture taken as the steel skeleton was going up. It shows the erection of a 53-ton fabricated truss—one of five designed to support the ballroom ceiling and upper floors of the building. Muscle for the job was supplied by Bethlehem wire rope, Purple Strand grade, which has the strength and fatigue-resistance for even the heaviest lifts. As a matter of fact, it could hoist such trusses all day long and still be ready for more.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others: CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING



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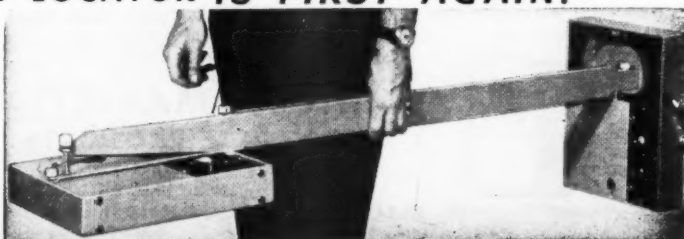
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WILKINSON PRODUCTS COMPANY

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 521



As each Rocform section is stripped, a workman oils it and it is placed on a truck for removal to the next pour.

Rubber pavement

■ Surfa-Aero-Sealz, a synthetic rubber blended with tar, is said to protect airfield pavements from the deteriorating effects of spilled jet fuel, according to a booklet from the Naugatuck Chemical Division of United States Rubber Co. This surface mix is said to conform to the design criteria of the U. S. Army Corps of Engineers. General procedures for use of the blend as a binding agent on hot-mix tar-rubber surface courses are detailed. Data is given on the composition of the mixture and on the latest findings on the effects of jet fuel and blasts on asphalt pavements.

To obtain the booklet write to Naugatuck Chemical Division, United

States Rubber Co., Naugatuck, Conn., or use the Request Card at page 18. Circle No. 172.

Two-way radio

■ Project foremen will be able to coordinate all the operations of road-building construction crews with the help of a Motorola two-way radio, according to a folder from the firm. The folder points out that the radio can be used for dispatching and re-routing equipment, receiving progress reports from crews, and for reporting breakdowns.

To obtain this folder write to Motorola Communications & Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 175.

Case history

Forming system reduces cost of concrete walls

The use of a truck-mounted crane and the Rocform system of forming concrete walls enabled the Titanus Cement Wall Co., Detroit, Mich., to pour basement walls for four homes a day with a crew of six men, including the crane operator, on a housing project near Detroit.

The Rocform system involves the use of 3/4-inch plastic-impregnated plywood panels in 3-foot widths, easily handled by one man, with permanently-attached metal wales. A complete set includes all hardware, a sufficient number of standard panels, and a number of narrower strips in 2-inch variables for use as fillers. These, and a 3-inch variable adjustment on the outside corner clamps, eliminate any need for extra lumber for filler strips on odd-sized jobs.

For crane operation, the panels are made into permanent 12-foot sections. Because setting and stripping of the forms is a simple task, no skilled labor is required. The manufacturer claims the forms will last for as many as 300 pours. After the panels are worn out, tie rods, clamps, and wales—representing about half the original investment—can be salvaged for continued use.

Use of the Rocform system is not confined to small buildings. It is being used in the construction of a seven-story, reinforced-concrete hotel in Florida, and has been used on steam power plants and other structures.

For more information on this new form system write to the Rocform Corp., 15160 W. Eight Mile Road, Detroit 35, Mich., or use the Request Card at page 18. Circle No. 205.

Generator plants

■ The correct portable power plant for every job is shown in a folder from Master Vibrator Co. Job photos point out the various models of Master plants and their uses. Full specifications are listed for each model.

To obtain Form No. MV-1025 write to Master Vibrator Co., 265 Stanley Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 43.



RUGGED WAGNER EQUIPMENT

makes a tractor your most versatile and inexpensive construction tool

Now a tractor can be the most important single tool on your construction jobs. When it's teamed up with rugged Wagner tractor equipment, nothing else can do so many jobs so well.

By equipping a tractor with a Wagner Backhoe you make short work of digging footings, sewer, gas and power trenches and septic tanks. Likewise a tractor and a Wagner loader do a faster,

better job of land clearing, excavating, back-filling and landscaping. And all the while you'll be speeding construction, saving man-hours and increasing profits.

Check with your nearby Wagner dealer to see how Wagner tractor equipment can cut time and labor costs on your construction jobs.



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CITY _____ STATE _____

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 522



Labor review

Contractor associations that administer welfare and pension plans covering 100 or more employees would have to submit annual reports to the government if legislation proposed by a Senate Welfare Fund Subcommittee is enacted into law. All plans, whether run by the union, the employer, or by both, would be affected. The Subcommittee favored the

Securities & Exchange Commission as the administering agency "because of its organizational setup and its established success in the administration of disclosure-type statutes."

AFL-CIO President George Meany hailed the proposal, but objected to making SEC responsible for it because that agency is too "management-minded." Employer objections are

centering around the proposal's inclusiveness. Only joint and union-run plans, a small proportion of the total, have been shown to be maladministered, they argue.

The suggested legislation would require all plans covering at least 25 employees to register with the selected agency. Plans covering at least 100 employees would have to submit annual reports, while similar reports could be required of 25 to 100-employee plans at the administering agency's discretion. The formation of a 13-man advisory committee to assist the administering agency was also suggested.

Carpenters in Klamath Falls, Oreg., received a 20-cent-an-hour wage boost in a 21-month pact signed with

the Associated Building Contractors and Employers of Klamath Falls and agreed to come under the statewide contract between Oregon's carpenters and the AGC as of January 1, 1958. Under the new agreement the Klamath Falls employer group will be absorbed by the AGC, which will then handle all collective bargaining.

The separate agreement covering Klamath Falls carpenters, which provides for a wage rate higher than that prevalent in Oregon has been a sore point with contractors for several years. The 20-cent increase, the union's original demand, brings its rate to \$3 an hour, 10 cents over the statewide level.

A \$275,000 damage suit was filed in the U. S. District Court for Maryland by general contractor Henry A. Knott against the Baltimore Building Trades Council and Ironworkers Local No. 16, in a follow-up to an Appeals Court decision unfavorable to the unions. The U. S. Court of Appeals at Richmond, Va., ruled that though pickets' signs clearly indicated that a picket line was for the legitimate purpose of organizing Knott's employees, the effect of the picketing and the unions' objective was to make neutral union subcontractors stop meeting contractual obligations with Knott.

In deciding, the court reversed an NLRB okay for picketing by the building trade unions at a site where both Knott and his subcontractors were working, on the basis of the clear wording of the signs. However, the Appeals Court felt, the picketing resulted in the subcontractors' union employees refusing to cross the picket lines, thereby creating pressure on Knott which was not the "incidental effects of legitimate primary picketing."

A carpenter hired in a central office for employment at various job sites



TAKES OBSTRUCTIONS IN STRIDE



HAS GOOD OPERATOR VISIBILITY



OUTRIGGERS LEVEL UNIT



FORMED PLATE BOOM AND STICK



SHOVEL BUCKETS FOR EVERY PURPOSE



DUMPS AT 11 FEET

NEED A WORK-HUNGRY, EASILY OPERATED
DIGGER? ... SHOVEL? ... CRANE?

HOPTO
is *YOUR*
LOW-COST ANSWER!

completely
hydraulic

Here's the fast cycling, 200° swing, completely hydraulic digger-shovel-crane that reaches out for work! HOPTO has a 16½' reach at ground level beyond the boom mounting; digs more than 11' deep and dumps at 9½' with backhoe and 11' with shovel bucket! It's the easy-to-operate unit your handy man will handle like a veteran in half a day!

HOPTO mounts on any ton-and-a-half or larger truck. Hydraulic outriggers level unit and take load from truck chassis and spring mechanism! Feather-touch controls in the full visibility cab actuate every movement of unit and outriggers. No belts, pulleys, cables or sheaves on a HOPTO! It's completely hydraulic!

The 1500 PSI hydraulic system has overload relief valves, double wire braided hoses, 5" inside diameter hydraulic cylinders with 2½" chrome plated piston rods, and a large oil reservoir for most efficient operation! Self aligning bearings and hardened alloyed steel pins... formed steel plate boom, stick, and sub-frame... direct mounting of pump on power unit... crowd cylinder above boom... these are but a few of the many long-life, low-maintenance features of the quarter-yard, work hungry HOPTO.

Write for complete information on the model or models for your requirements



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 523



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won't worry about
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IGLOO WATER COOLERS

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IGLOO out-cools and out-leasts the old-time water barrel because it's corrugated for extra life, all-steel made for extra strength, galvanized to be rust-proof, leakproof with double locked seams and sanitary to the Nth degree. There's an IGLOO for every need—2 to 15 gallon sizes.

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For more facts, circle No. 524

CONTRACTORS AND ENGINEERS

cannot collect unemployment benefits for joblessness caused by labor disputes at the job sites, the New York State Appeal Board ruled recently. In reversing a referee's findings, the Board reasoned that the carpenter's place of employment was always the contractor's central office. His loss of employment was due, therefore, to a labor dispute in the "establishment" where he was employed.

The referee had ruled that the carpenter was separately employed for each job. Therefore, his loss of employment was not due to a labor dispute at the "establishment" where he was working and he was eligible for compensation.

A six-month walkout by building trade unions at a water filtration project in Willoughby, Ohio, allegedly resulting from the hiring of non-union labor by the general contractor at another job, ended recently when the unions reportedly came back on the job to persuade the contractor to drop secondary boycott charges filed with the NLRB.

The unions walked out at the filtration project when the Jack Lacoste Co., Cleveland, Ohio, the general contractor, hired some non-union workers at another operation in Maysville, Ky., because, the firm said, there were no building trades, as such, in Maysville. The Lacoste organization has no formal union contract, but had been abiding by union conditions and using union labor at Willoughby.

Representatives of the building trade unions in Cincinnati and Portsmouth, Ohio, and Lexington, Ky., came to Maysville and allegedly wanted the contractor to discharge the non-union men and hire members of their unions. The unions also reportedly wanted the traveling expenses of its members in getting to Maysville paid by the contractor. The unions allegedly threatened to pull their members off the Willoughby job

if Lacoste refused.

The contractor did refuse. Subsequently, a walkout began at the filtration project last October. Unfair labor charges were filed on April 2. The employees went back on the job three weeks later.

The Building and Construction Trades Department of the AFL-CIO announced it will oppose mergers of state and local labor federations until an agreement is reached with the Industrial Union Department, primarily on the question of jurisdiction. Eighteen craft unions, with a membership of about 3,000,000, signed the resolution.

Meanwhile, the initial two-day meeting of the Industrial Unions-Building Trades Joint Committee

ended with very little apparent progress toward agreement on rules and procedures to be followed in settling conflicts of interest between affiliates of the two departments. A statement issued at the close of the Joint Committee confab said, "We feel that a start has been made in exploring areas of difference. We intend to hold further meetings. . . ."

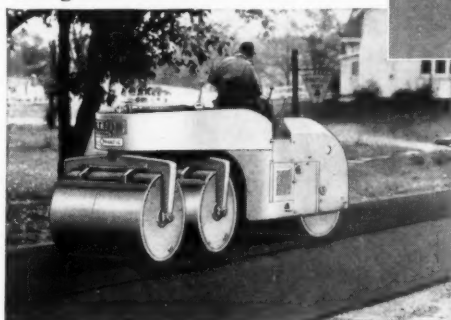
In New Jersey, retention of traditional craft jurisdiction in the merged labor federation was the major theme of the 52nd annual convention of the state's Building & Construction Trades Council. Richard S. Gray, president of the Building-Construction Trades Department, told the 300 attending delegates that the crafts unions would not be pushed around

in negotiations with industrial-type unions. The president of the New Jersey council, Sal Maso, urged more active organizing efforts "so that all maintenance workers (will) be brought under our craft jurisdiction. . . ."

Average weekly earnings of contract construction workers climbed to \$96.75 in February of this year, compared to \$95.68 in January and \$91.43 in February, 1955, according to the Bureau of Labor Statistics. The average weekly hours in February, 1956 rose to 36.1 over January's 35.7 and last February's 35.3, while hourly earnings in February were at the same \$2.68 rate as in January, which is an increase of nine cents over the \$2.59 hourly rate of February, 1955.

Most Effective Compaction With Fewest Passes

A 3-axle tandem roller, with a variable weight range from 14 tons (metal weight) to 20 tons fully ballasted with water, is now being built by GALION. In addition to the main compression or drive roll, it has twin guide rolls with synchronized hydraulic steering. You get up to 50% smoother finish rolling than with conventional tan-



dems, and up to 60% greater tonnage of material can be compacted per day. You get faster and better compaction of joints and seams. Elimination of cross-rolling saves you time and money.

TRANSFER OF WEIGHT PRINCIPLE

With the three rolls of the GALION 3-axle tandem roller operating on a plane, an effective transfer of weight occurs whenever one of the rolls hits a high spot in the surface being rolled. When this takes place, only two of the rolls are in contact with the surface. Therefore, the weight of the third roll transfers to the other two, thus bringing more compaction weight to bear on the high spot. This feature accounts for the extremely high compaction efficiency of the Galion 3-axle tandem roller.

GALION gives you the most effective and economical driving power obtainable. The ROLL-O-MATIC Torque Converter (GM - Allison) Drive differs from a fluid coupling drive. A fluid coupling transmission requires a manual gear shift mechanism, and the fluid coupling itself never multiplies engine power.

The Galion ROLL-O-MATIC Torque Converter Drive has no gear shift mechanism. Furthermore, it automatically MULTIPLIES the engine driving force by means of oil in motion instead of by transmission gears. It automatically APPLIES the driving force as the work demands. When the Governor Lever is moved to a selected rolling speed, the engine power will be applied and regulated AUTOMATICALLY — up hill, on the level, down hill, and around curves. Reversing action is velvet-smooth; shock loads are eliminated.



ROLL-O-MATIC Torque Converter DRIVE . . . is STANDARD EQUIPMENT

MORE EFFECTIVE COMPACTION WITH BETTER FINISHING



On level surfaces all rolls compact and finish.



With drive roll on high spot, weight of center guide roll transfers to other two rolls.



With center guide roll on high spot, all weight of end guide roll and part of compression roll weight transfers to center guide roll.



With rear guide roll on high spot, weight of center roll transfers to other two rolls.

EYE-OPENING RESULTS

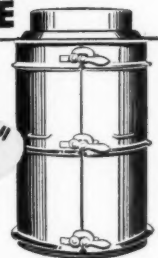
The Galion ROLL-O-MATIC Torque Converter Drive saves up to 25% in fuel, engine life is increased 35% and life of forward-reverse clutches 40-50%. Elimination of master clutch, gear shifting, and shock loads results in unequal ease of operation. Rolling speeds from .8 to 5.5 m.p.h. are available.

For complete information, fill in and return the coupon.

Please send me literature on the Galion Rollers checked.		THE GALION IRON WORKS & MFG. CO., Dept. CE-66, Galion, Ohio, U.S.A.	
<input type="checkbox"/> 3-AXLE TANDEM		PERSON _____	
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CALL ON Quinn For QUALITY CONCRETE PIPE FORMS



Backed by over 45 years of reliable service, the QUINN Heavy Duty form is recognized as the STANDARD design and the finest concrete pipe form everywhere. Used in making pipe by vibration, spading or tamping. Sizes for pipe from 10" to 120" and larger. Tongue and groove (as shown) or bell end pipe in any length desired. If your pipe orders specify extra large sizes, odd shapes or unusual lengths, there's a Quinn form made to produce the finest pipe at lowest possible cost.

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Illustrates our complete line of equipment. Contains pages of valuable tips for the concrete pipe manufacturer. Write today for your free copy and estimates.

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For more facts, circle No. 525

Units simplify handling of brick, other material

■ Two material-handling crane attachments, designed for use in raising stacked brick and palletized materials from the staging area to the upper floors of a building, are offered by A. F. Kuehne, Needham, Mass. The attachments are known as the Brick-Lift and the Floor Loader.

According to the company, the Floor Loader eliminates the need for an elevator hoist in building construction, and consequently does away with the concentrated traffic around that area of the decks where the elevator unloads. The Brick-Lift is said to simplify the handling of bricks at the construction site.

The Floor Loader is a U-shaped de-



◀ As the upper arm of the U-shaped Floor Loader hooks onto a deck, the palletized load, suspended from the other arm, swings onto the floor below.

Resembling a pair of brick tongs, the Brick Lift can handle a stacked load of 312 bricks. The crane-operated unit securely grips the load and is used to deposit it on the bricklayers' scaffold. ▶

vice with a pair of wheels at one tip and a sling at the other. It is attached to the crane at one of the

angles. The sling is fastened to palletized or self-contained loads, and a crane lifts the rig so that the wheeled

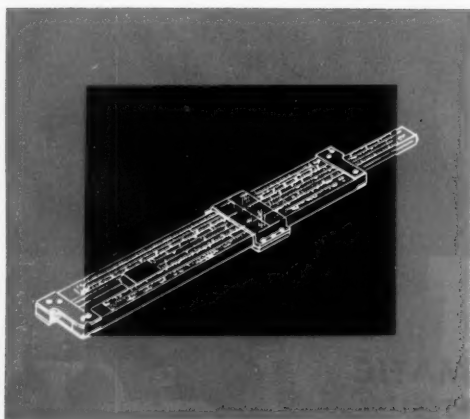


tip hooks onto the deck above the one where the material is needed. Because of the Floor Loader's shape, the loaded tip swings in where the material is needed as the other tip hooks to the floor above.

The Brick-Lift is basically a massive set of brick tongs that will clamp a stacked load of 312 bricks. Attached to the hoist, it will raise its loads and deposit them on the scaffolds as needed, thus eliminating much transferring of the brick between the staging area and the bricklayer.

For further information write to A. F. Kuehne, 73 Warren St., Needham 92, Mass., or use the Request Card at page 18. Circle No. 180.

THE "SPECS" TELL THE STORY



MODEL HTS LOW BED

20 Ton capacity — Weighs Only 8,250 pounds (also available in 15, 25, 30 and 35 ton capacities) Although as much as a ton lighter than other trailers of comparable capacity, high-tensile steel main channels and close-spaced all-welded cross members give the HTS superior strength and ruggedness. Flat goose-neck provides support for blades and other loads.



NEW SELF-LOADING FLOAT

This trailer will actually carry 45,000 pounds concentrated in 10 feet of its length! The secret is the extra-deep high-tensile steel main frame that we "tailor" to length and load requirements:

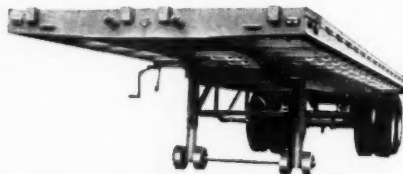
14 inches deep on floats 28 through 31 ft.
16 inches deep for lengths 32 through 35 ft.



TANDEM TILT-TO-LOAD

15,000 and 20,000 lb. capacities
Weights: 2,500 and 2,700 lbs.

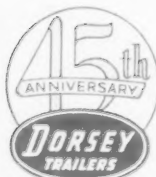
Speed and efficiency as well as economy are combined in this versatile tilt model: it's so light a dump truck pulls it easily. Two-way hydraulic control is so precisely balanced the weight of a man will tilt it up or down. Single axle models also available.



THE GIANT PLATFORM

44,000 lb. capacity — Weight: 8,410 lbs.

In the year since its introduction, the Giant has become America's No. 1 platform! Although as much as 2,000 lbs. lighter than other platforms, it has even greater strength.



For the complete facts on any model heavy-duty trailer, see your Dorsey distributor — or wire collect.

DORSEY TRAILERS / ELBA, ALABAMA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 527

Kaiser names two managers

W. Frank Bort has been named manager of industrial construction and Stanley Kimball manager of heavy construction for the Kaiser Engineers Division of Henry J. Kaiser Co. Bort will be responsible for all industrial construction within continental United States, while Kimball will supervise heavy construction work and engineering design on joint ventures.

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For more facts, circle No. 528
CONTRACTORS AND ENGINEERS

Two utility diesels added to tractor line

■ Two new utility models of the Fordson Major diesel tractor, designed for use with equipment such as loaders, trenchers, and diggers where hydraulic lift and implement linkages are not required, are announced by the Tractor & Implement Division of the Ford Motor Co.

With the exception of the hydraulic system and linkages, the new utility models have all of the features of the standard FMD four-wheel tractors, including six forward and two reverse speeds, sealed-beam headlights and taillight, adjustable swinging drawbar, 12-volt electric system and starter motor, oil-bath air cleaner, transmission-type power takeoff, and 600-pound wheel weights.

The FMD-U12, like the standard FMD-12, has 12-inch rear tires, while the FMD-U14, like the standard FMD-14, has 14-inch rear tires. Both new models are equipped with 7:50 x 16 front tires. The FMD-U12 has rear tread adjustments of 52 and 72 inches; the FMD-U14 can be set at 58 or 62-inch rear-wheel spacings.

For further information write to the Tractor & Implement Division, Ford Motor Co., 2500 E. Maple Road, Birmingham, Mich., or use the Request Card at page 18. Circle No. 153.

Erie Strayer appoints new sales representative

Erie Strayer Construction Co., Erie, Pa., has assigned Hugh C. Riley as the new district representative for the states of New York, West Virginia, Kentucky, Ohio, Michigan, Indiana, and Wisconsin. He will also cover western Pennsylvania and northern Illinois.

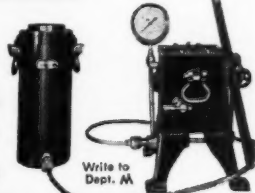
Riley will work exclusively with distributors, manufacturers, and dealers in his territory.

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
UNDER-PINNING
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DESIGNERS and MANUFACTURERS OF

Hydraulic Units
For Special
Applications


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789 BERGEN STREET BROOKLYN, N. Y.
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Case history: Pulled along by the two men at the ends, this specially designed Stow vibrating screed strikes off and shapes the surface of a Massachusetts Turnpike bridge deck. Since the outside lane, interchange, and inside lane were of different widths, Bayer & Mingolla Construction Co., Worcester, Mass., had to use three different screed beams. The detachable vibrating unit, powered by a 2½-hp motor, and end-roller assemblies were easily changed from one beam to another, however. For more information on these vibrating screeds write to the Stow Mfg. Co., 40 Shear St., Binghamton, N. Y., or circle No. 224 on card at page 18.






Teeth that really DIG



SHARP teeth
mean more
ditch

FORGED means
ALLOY STEEL
NOT A CASTING
greater strength

added up means
more production



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TOOTH COMPANY

1540 South Greenwood Avenue
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LOGGERS & CONTRACTORS MACHINERY COMPANY
240 S. E. CLAY STREET - PORTLAND 14, OREGON



Designed with a truck-type steering axle, a built-in tow bar, safety chains, and a tie-in braking system, the Rinson NF 60 may be towed safely at highway truck speeds.

New fork-lift is towed at highway truck speeds

■ A new fork-lift truck designed to fulfill the requirements of heavy construction material-handling has been announced by Rinkin & Olson. Lifting capacity of the Rinson NF 60 is 2 tons on 24-inch load centers.

An advantage of the NF 60 is that it may be towed safely at highway truck speeds by means of a truck-type steering axle, built-in tow bar, safety chains, and a tie-in braking system. Towing, tail, and stop lights are standard, front and rear. The forks tip back to become fender flaps, thus reducing the over-all length of the rig.

The NF 60 is said to move easily over rugged terrain because of its 8-inch-high ground clearance and semi-rigid frame construction. It is powered by a Ford 115-hp industrial engine and employs standard Ford truck parts. It has one reverse and four forward speeds and four-wheel hydraulic brakes.

For further information write to C. Rinkin & H. Olson, 725 E. Huntington Drive, Monrovia, Calif., or use the Request Card at page 18. Circle No. 143.

Levels and transits

■ Various models of surveying instruments are featured in a catalog from the David White Co. Units pictured and described include engineers' transits, U. S. Army transits, convertible levels with shifting centers, and a combination level and transit. Also included are tripods for levels and transits, plumb bobs, and leveling rods.

To obtain Bulletin No. 1055 write to David White Co., 315 W. Court St., Milwaukee 12, Wis., or use the Request Card that is bound in at page 18. Circle No. 33.

Rock ripper

■ The Ateco rock ripper for mounting on Caterpillar D9, D8, D7, and D6 tractors is featured in a catalog. Equipped with positive hydraulic control and curved gooseneck shanks, the unit can rip to depths of 30 inches. An optional subsoiler shank that can rip to a depth of 48 inches is diagrammed. Job photos and specifications are included.

To obtain the catalog write to American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 14.



"He's doing something wrong!"

Advertisement

NO TRAFFIC INTERRUPTIONS ON 80-FOOT FREEWAY CONSTRUCTION

Fast Mixing of Cement Treated Sub-base Key to Successful "Foothill Freeway" Job

Transforming a 30-foot wide California street into a major 80-foot 4.48 mile freeway, without obstructing traffic or utility lines, within cost and time limitations is an accomplishment recently completed in Los Angeles County. One of the most serious construction problems, the tricky cement-treatment for the 6-inch sub-base course, was handled profitably with the help of a Seaman-Andwall TRAV-L-PLANT and a Seaman-Andwall HERCULES Cement Spreader.

Construction consisted of ripping out bituminous shoulders along each side of the old pavement, building necessary widening areas with grading equipment, cement-treating six inches of granular sub-base material along both sides of the old pavement, placing four inches of asphalt plant mix over this base course, and resurfacing part of the boulevard slab with two inches of plant-mix asphalt — merging all in a finished freeway plan.

Sub-Base Treatment

Probably one of the most unusual items in the project was the treatment of six inches of sub-base material with 2½ percent by weight of portland cement — to introduce greater stiffness into the sub-base and to reduce the plasticity index. This construction varied from 23 to 44 feet wide, and was handled in sections averaging 600 feet in length — the amount of square yardage that could be handled in half a shift. This practice follows national recommendations proving definite relationship between prompt mixing, blending, compaction and specified added strength of the finished base.

After a section had been leveled and made ready for this treatment, bulk cement was applied by a Hercules Spreader and metered in precise percentage as demanded, laid down in a flat strip just ahead of the mixing operation.

Dry-Mixing, Wet-Mixing

After the cement was laid down, an initial dry-mixing pass was made first by the Seaman-Andwall TRAV-L-PLANT to develop an excellent blend. With rotor and tines set accurately for the exact six-inch mixing depth, the TRAV-L-PLANT action mixed and moved sub-base

particles laterally as well as horizontally for an intimate blend with the cement. On the second pass, the TRAV-L-PLANT was hooked to a water tank-truck, applying approximately 8½ percent moisture through the TRAV-L-PLANT's pump, meter and spray bar at a rate of about 200 gpm. After this pass, a temporary or additional mixing pass followed, leaving a beautifully uniform damp strip of cement-treated base ready for final compaction.

Despite the difficulties of restricted work areas, the need for continuing traffic, and interference with utility connections, some excellent performance records were chalked up. The TRAV-L-PLANT completed an average of 68,500 square feet of cement-treated base in a day's time at unusually low cost. The self-propelled Seaman-Andwall TRAV-L-PLANT had several advantages: staying out of the way of traffic, getting in and out fast, staying ahead of other machines, and keeping up with the cement-delivery operation.

The job was handled by Schroeder & Co. of Sun Valley, California, under the general supervision of John V. Hayden, General Sales Manager and Chief Estimator, with John Sawyer, Field Construction Superintendent.



Cement, carefully metered to precise 2½ percent by weight is applied by Seaman-Andwall Hercules Spreader, to leveled and graded sub-base material.



Initial dry-mixing pass with Seaman-Andwall TRAV-L-PLANT with rotors and tines set for the full six-inch mixing depth, provides a uniform and intimate blend of cement and materials.



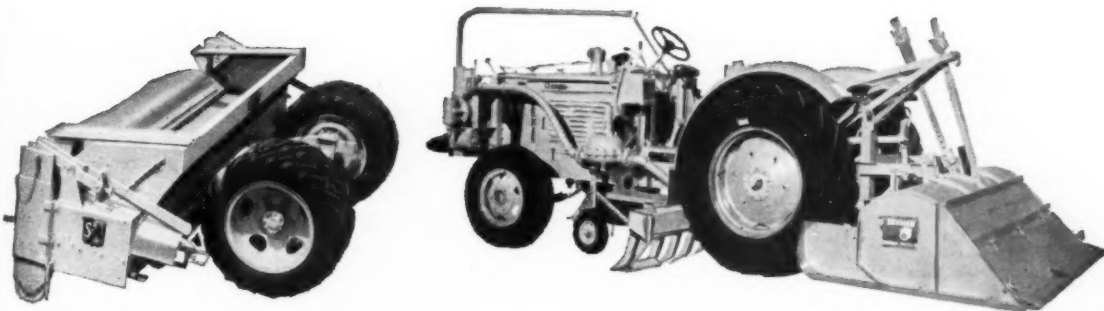
After the dry-mixing operation the TRAV-L-PLANT pumps water from a tank-truck and applies the moisture through integrally mounted pump, meter and spray bar, mixing the water into the full depth. Leaves a uniform, damp strip of cement-treated base, ready for final compaction.



SHEET-METAL FABRICATORS put together an Armco multiplate pipe arch during the construction of the Swan River Highway between Seeley and Swan Lakes, an alternate route to Glacier National Park. Using an Ingersoll-Rand Model 534 impact wrench powered by a Le Roi compressor, workmen assembled the 7-gage sections and 5-gage invert sections beside the creek and later pushed the arch into position with bulldozers. This multi-plate structure, used by Goodfellow Bros., Inc., Wenatchee, Wash., in the construction of a 7.8-mile stretch of the highway, measures approximately $8\frac{1}{2} \times 14$ feet in diameter and 60 feet on the center line and has a 2 to 1 slope on the ends. For details write to Armco Drainage & Metal Products, Inc., Middletown, Ohio, or use the Request Card at page 18. Circle No. 54.



ACCURATE SPREADING • FAST MIXING your answer to soil-cement stabilization problems.



Seaman-Andwall HERCULES Cement Spreader Spreads with absolute accuracy

This modern heavy-duty box-type spreader is designed for fast, accurate spreading of bulk cement in any amount required up to 10 feet in width. Special strike-off bars provide quantity control, the first bar delivers approximate quantity to conveyor; the second bar measures exact desired quantity. Dual pneumatic tires for traction and mobility, operate an Auto-Type Differential, permitting efficient transfer of power at all times. Fast, smooth-operating, easy adjustment, quick installation, are proven advantages.

Seaman-Andwall TRAV-L-PLANT Mixes faster, more thoroughly

Completely self-propelled, fast and versatile, the TRAV-L-PLANT does a thorough and more uniform job of mixing in either new construction or reconstruction. Blends coarse and fine aggregates, fills voids and mortars-in the coarse securely for greater load-bearing value.

Pump, spray bar, tachometer assemblies and volumetric meter apply water or bitumin simultaneously with in-place mixing operation. Gasoline or Diesel powered, 7-foot mixing width. Can also be equipped with special Underbody Scarifier for light scarification.

Other Sta-Bilt Equipment:

- Self-Propelled Pulvi-Mixers
- 2-3 Ton Portable Steel Wheel Rollers
- Century Material Spreaders
- Portable Rock-Busters

Write for FREE bulletin "Processing Soil Cement". Illustrates and describes new methods and equipment for building soil-cement roads at lowest costs.



Seaman-Andwall PNEUMATIC COMPACTOR Compacts to higher densities

A revolutionary new design, self-propelled for transport road speeds up to 20 m.p.h. this new Seaman-Andwall Pneumatic Compactor provides better compaction to higher densities. Front drive provides new "straight down" pressure to avoid pushing action, surface shear, scuffing, material displacement, even in turning. Power steering permits easy 180° turn on a 21-foot road. Ballast compartment provide weight adjustments up to 20 tons. Complete with electric brakes and lights for night transport.



STABILIZING THE WORLD
SEAMAN-ANDWALL
CORPORATION

282 No. 25th St. • Milwaukee, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 531

Case history

Power trowels complete big operation quickly

A four-man crew completed the job of troweling 140,000 square feet of concrete deck in 14 days, using Superior four-blade power trowels, during the construction of the new Pacific Intermountain Express motor freight terminal and fleet maintenance shops at Montebello, Calif.

The 5 to 6-foot-thick decks had to be very smoothly surfaced to take full advantage of sub-floor heating elements. The trowel operators found that their four-blade machines served as guides to eliminate guesswork in judging the flatness of the finished concrete. Just as one leg of a four-leg stool will remain suspended over an uneven surface, one blade of the Superior power trowel always gave the signal when an uneven deck area was encountered.

The power trowels proved to be time-savers because their blades could be adjusted from floating to finishing pitch without stopping the motors. Crank adjustments attached to the handles gave instant blade pitch control. The trowels' stationary guard rings permitted the operators to work their machines close to walls and obstructions, reducing the need for hand-finishing.

For more information on Superior power trowels write to the Superior Cement Tool Co., 11616 Wright Road, Lynwood, Calif., or use the Request Card at page 18. Circle No. 190.

New waterstop achieves good bond with concrete

W. R. Meadows, Inc. has announced its new Durajoint waterstop and expansion joint, said to provide



an efficient and economical means of sealing concrete joints.

According to the company, Durajoint is designed for use between adjacent sections of plain or reinforced-concrete structures such as tanks, channels, tunnels, culverts, swimming pools, walls, roofs, and dams.

Durajoint is manufactured with longitudinal ridges on the surface that insure effective bonding to the concrete. A central hollow tube reportedly increases the capacity of the material to handle extension and lateral movement of the masses of concrete without the joints being sheared.

The new waterstop is said to have an extremely high tensile strength of not less than 1,900 pounds per square inch. It is resistant to acid, alkalis, chlorinated water, and lubricating oil.

For further information write to W. R. Meadows, Inc., 7 Kimball St., Elgin, Ill., or use the Request Card at page 18. Circle No. 164.

The Engineering Department

Simplified Deatherage cost system and the keeping of drawing records

by GEORGE E. DEATHERAGE, P. E.
Construction Consultant



Here's the safest
ratchet lever hoist
ever invented!



If overloaded, "safety valve handle" will bend before any other part of hoist fails.

It's the original Coffing Safety Pull, a ratchet lever hoist with dual pawls and ratchet that keep load from slipping. Safety stops prevent spinning out of control and if overloaded, "safety valve handle" will bend before any

other part of hoist fails. The $\frac{3}{4}$ -ton model (illustrated) weighs but 14 $\frac{1}{2}$ lbs.

Fifteen other models available handling up to 15 tons. Ask your recognized distributor or write for bulletin SP, Coffing Hoist Division, Duff-Norton Company, 810 Walter St., Danville, Ill.

The exclusive, cadmium plated Coffing Safety Hook with spring actuated locking latch designed to shed, not snag, on wires or other objects is available for the $\frac{3}{4}$ -ton, 1 $\frac{1}{2}$ -ton and 3-ton models at slightly additional cost.



COFFING HOISTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 532

In preparing the way for a job, the contractor would do well to make sure that the keeping of records, filing, posting, and all paper work is properly mapped out in advance and reduced to a routine.

Whether a cost system is used or not, a number of records—the keeping of a time book, daily time reports, time posting, and the labor distribution sheet—have to be kept. If possible, this paper work should be so organized that operations are not repeated when a cost system is installed.

Paper work can be greatly simplified if the cost system to be used is well adapted to the job under way. The decision as to how fine a breakdown of work should be made depends on the volume of work being done, and the practicality of measuring the amount of work done per shift.

If, for example, a contractor is interested in securing the cost of rough framing, which has been assigned Number 14 under a cost code, he must determine if there is any justification for breaking this down into such classifications as 14-15, girders; 14-17,

ceiling joists; 14-18 rough framing, 14-19 studs; and so on. If the structure is to be of masonry and steel, with a fire-resistant roof, it will not be important to have many units in the breakdown, and everything might well be lumped under "rough framing". But if the work is being done on a housing project where a large amount of wood framing is being used, a detailed breakdown will allow the contractor to check his costs on all carpentry classifications.

Proper and successful costing starts with the estimator, who is trained in breaking his job down to all the separate items appearing on the estimate check list so that all items have been covered and priced as separate units. If the contractor has an estimator who works on the "square-foot" basis—covering girders, joists, bridging, subflooring, insulation and finish floor—there is little justification in securing separate unit prices on all these items.

Many contractors are satisfied with weekly cost summaries, but the wide-awake contractor will have daily checks made so that if money is being

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CONTRACTORS AND ENGINEERS

Figure 1

GEO. E. DEATHERAGE & SON		Foreman's Report		Date 11-5-52	
Building WUSE-606		Gang CARPENTER		Code 14-21	
Badge No.	Description Work Done Today	Hours	O.T.	Rate	Amount
	Bal. Brot. Forw.	4.05			920.00
2053	LAYING SUB-FLOOR	8		2.50	20.00
2054		8		2.50	20.00
2055		8		2.50	20.00
2056		8		2.50	20.00
2057		8		2.50	20.00
2058		8		2.50	20.00
2059		8		2.50	20.00
1920		8		1.75	14.00
2060		8		1.75	14.00
1109		8		1.75	14.00
Total This Ticket		80			182.00
Total Carried Forward		4.05			1102.00
Quantity Work in Place		Payroll	Av. Unit Cost	Est. Cost	
Previous	18,900 sq. ft.	920.00	.05	.06	
Today	3,500	182.00	.052	.06	
Total	21,900	1102.00	.05	.06	

lost, the fact can come to light immediately and action can be taken to remedy the situation. If properly organized, daily costing is no more trouble than weekly costing, and it is likely to be much more accurate.

Deatherage system

A system of costing that reduces paper work to essentials is one that I have put into practice on a number of jobs. The system is simple, and it involves very little work for the foreman, who can make several records at one time on carbon-backed forms so that reporting and rewriting is unnecessary later on. Essentially, it resembles the customer-account system used by local grocerymen.

The system uses no stock forms; each contractor must order the paper-covered booklet of carbon-backed forms of the sales-book type, in the number and size desired, which are imprinted with the firm's name. The

forms, one of which is shown in figure 1, consist of an original copy, a duplicate, and a triplicate. The first two sheets are perforated so they can be removed from the booklet. The third copy remains in the book as the foreman's time record.

Foreman's task simple

The total amount of hours worked or materials used is entered on a ticket, together with the accumulated total used to date, which is carried over from the latest entry. This record of continuing totals is kept on file in a visual file system so that totals for previous days can be read by anyone interested.

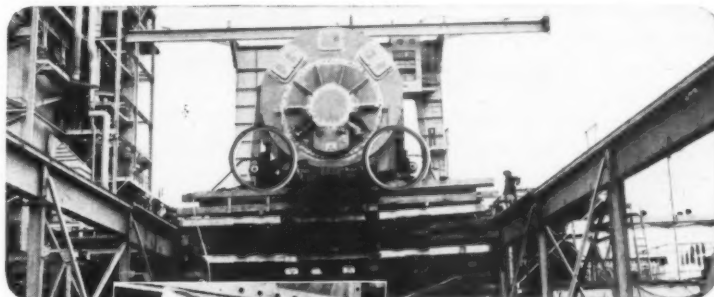
A separate ticket is made out for labor expended on each type of work shown on the cost code. As a shift starts, the foreman fills in the ticket with the badge numbers of the workmen assigned to the job, the date, and the type of work being done, then

This is the sixth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent and who need practical help in order to take complete charge of construction projects themselves.

signs his name.

This is equivalent to the foreman checking his men in the morning before work starts, but there is one important exception. He fills in all required information immediately, instead of waiting until the end of the shift and then trying to remember

where his men worked during the day. If men are moved to other work during a shift, the information is written down immediately on a new ticket. This eliminates a lot of guesswork in the field. The foreman does not fill in rates or calculate the amount of money due his men. This



Duff-Norton air jacks

Raise Big Loads—and Profits

By ingenious use of Duff-Norton air jacks, a Dallas contractor finds that he lowers costs, speeds work, gets greater dependability and safety with these portable tools on difficult installations of big equipment.

Using two 100-ton capacity Duff-Norton jacks, the mechanical contractor, E. E. Farrow Company, raised a 240,000 lb. turbo-generator 22 ft. at the plant of the Western Farmers Electric Co-operative. Three men completed the job in 2½ days with a jacking-blocking procedure which resulted in a savings of \$400.

Duff-Norton air motor jacks were also used to raise a 210-ton, 100,000-kw generator 13 ft. at the Dallas Power & Light Company, Parkdale Station. These same jacks helped cut costs of similar jobs at Haskell, Lone Star, Corpus Christi and Riesel, Texas.

Duff-Norton air motor jacks have a lift of 14 to 30 inches and are mounted on rubber-tired, roller bearing wheels for easy positioning by one man. They operate on 80 to 100 lb. air pressure.

The six Duff-Norton models range in capacity from 20 to 100 tons—weigh from 238 to 530 pounds. A sturdy base prevents tipping or settling. Safe operation is assured by an automatic shut-off which stops motor when safe limit is reached. Keyway in ram prevents the head from turning and shifting load. Lowering and lifting speed is controlled by air motor. Jacks will not creep or drop the load.

For data on these cost reducing jacks and name of nearest distributor write Duff-Norton Co., P.O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-11-S.

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At the end of a shift, the original and duplicates of the tickets are turned over to the payroll clerk. No foreman's report—other than these tickets—is needed. Before the tickets are torn out of the book however, the foreman fills in the space provided for "Quantity of work in place today". The amount of work done previously, and the to-date total are calculated by others.

The timekeeper takes the tickets and consolidates the time worked on various job classifications on the daily distribution sheet. This is a necessary step, since more than one foreman may have charges for the same code number. All consolidated charges for a job classification on the daily distribution sheet are totaled and entered on the last ticket for that particular classification.

If the records agree on the total hours worked by each man, the clerk can calculate the money spent on each ticket and post this to "Total this ticket". He then adds this total to the money spent to date, which he obtains from the last ticket of the previous day, and carries the balance forward entering the amount under "Total carried forward."

GEO. E. DEATHERAGE & SON, INC.			
DRAWING WORK SHEET			
Dwg. Number _____		Cont. No. _____ Unit _____	
Drawing Title _____			
Reference Drawings _____			
Data Numbers _____			
Draftsman _____			
DATE	HOURS	DATE	HOURS
TOTAL HOURS ESTIMATED HOURS _____ REMARKS _____		TOTAL HOURS ESTIMATED HOURS _____ REMARKS _____	
SCHEDULED STARTING DATE _____		FINISHING _____	
ACTUAL _____		ACTUAL _____	
REMARKS _____		REMARKS _____	
DATE WORK ALLOCATED _____		COMPLETED _____	
DRAWING APPROVED _____			
CHIEF DRAFTSMAN			

CHIEF ENGINEER			
DATED FILED _____			
FILE CLERK			

He posts this amount under "Payroll" at the bottom of the distribution sheet, adds it to the previous amount, then enters the total payroll costs. These should agree with those of "Total carried forward."

The clerk follows the same procedure with "Quantity of work in place", and arrives at a total of the work done to date. Dividing the cost by the quantity of the work done, he arrives at the labor cost per unit for the day and for the total job to date. This can then be compared with estimated unit costs, which he also posts. This summarizing is done only on the last ticket for each classification. If more than one foreman is doing the same class of work, the tickets may be analyzed to get each foreman's costs at any time.

When this operation is complete, the tickets are sent to the payroll clerk and the duplicates retained for posting in the visual file. The contractor, project manager, and even the foreman can use this file, which will show the labor unit costs to date as compared with estimated units, on any work classification, from the last ticket posted at the close of the previous shift.

In practice, the system is fast, efficient, and accurate. And since a foreman handled only one trade, and only a few classifications of work under the





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Standard HIGHWAY GUARD-RAIL

New interchangeable sections that deliver the continuous high beam strength needed for today's highway safety. Wide lap joints, absence of sharp edges, flexibility and impact-shock cushioning minimizes damage. Easy erection, minimum maintenance, reduced inventory requirements and simple replacement allows greatest economy. Let Syro Steel Protecto-Beam give you positive protection and utmost economy on your highway construction.

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Protecto-Rail, companion to Protecto-Beam, for erection where barriers are needed, but the high strength of Protecto-Beam is not required. Perfect for Parking Lots, Building, Schools, Motels, Drive-ins, Loading Docks and Factories. Available in three styles, high-rib, flat-rib and 9-inch heavy duty rail. Pigeon-hole parking construction requires positive protection and absence of unsightly bulk. Flat-rib Protecto-rail solves this problem. Protecto-rail also serves to protect landscaping, driveways and other danger spots. The 9-inch heavy duty Protecto-rail has ample strength for most off-highway danger spots. Protecto-rails' ease of installation and flexibility allows economical barriers for any protection requirement. Steel posts are available for Protecto-Beam and Protecto-Rail.

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5. Tailgate positively locked, cannot be jarred open.

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1255 BOYLSTON STREET . . . BOSTON 15, MASS.

Figure 3

Gen. E. Duthong & Son INDUSTRIAL ENGINEERS			PROCESS CHART	<input checked="" type="checkbox"/> PRESENT <input type="checkbox"/> PROPOSED
SUBJECT CHARTED St'd. wdg. wall tracing			DATE 10/10/52	
18" Highway Culvert			CHART BY G.E.D.	
OPERATION Preparation tracing to B/P room for printing			CHART No. 42	
DEPARTMENT Engineering			SHEET No. 1 OF 1	
EST. FEET	TIME MIN.	CHART SYMBOLS	PROCESS DESCRIPTION	
		○ ○ ○	Squad leader reads order to make pencil tracing	
60	2	○ ○ ○	Walks to file room	
	5	○ ○ ○	Secures Dwg. No. from file clerk.	
60	2	○ ○ ○	Returns to squad leader desk.	
	10	○ ○ ○	Instructs draftsman to make tracing.	
	480	○ ○ ○	Draftsman prepares pencil tracing.	
15	2	○ ○ ○	Tracing to squad leader for checking.	
	35	○ ○ ○	Awaits checking.	
	12	○ ○ ○	Squad leader checks tracing.	
15	2	○ ○ ○	Returns tracing for revisions.	
	60	○ ○ ○	Revisions made.	
15	2	○ ○ ○	To squad leader for final approval.	
	20	○ ○ ○	Dwg. approved.	
40	3	○ ○ ○	To chief draftsman for OK	
	26	○ ○ ○	Awaits approval.	
	16	○ ○ ○	Approved	
	8	○ ○ ○	Steno. writes B/P order.	
70	5	○ ○ ○	To B/P room for prints	
		○ ○ ○	Awaits printing.	
	680	○ ○ ○	B/P made	
275		○ ○ ○	Tracing to file	
		○ ○ ○	Operations - 7	
		○ ○ ○	Transportations - 8	
		○ ○ ○	Storage / Delays - 3	
		○ ○ ○	Inspections - 3	

code system, he has little paper work.

Drawing Number Register

Clerical functions involved in han-

dling tracings, drawings, and sketches—like those for cost-keeping—can also be reduced to simplest terms if a routine procedure is set up at the start

of a job and followed consistently.

A file clerk should be in charge of the Drawing Number Register, which will contain a description of work covered by a drawing, and the title and name of the engineer to whom the number is given.

Each separate contract listed in the ledger should have a definite block of numbers assigned to it, and this numbering system should be followed exactly. Contract 1879, for example, may have "A" sheets, measuring 24×36 inches, numbered from 1500 to 15030, while "B" sheets measuring 18×24 inches might be numbered 890 to 1025. All drawings should be numbered according to the numerical divisions of the cost code being used. The first number of a drawing—the "block number" from those allocated in the

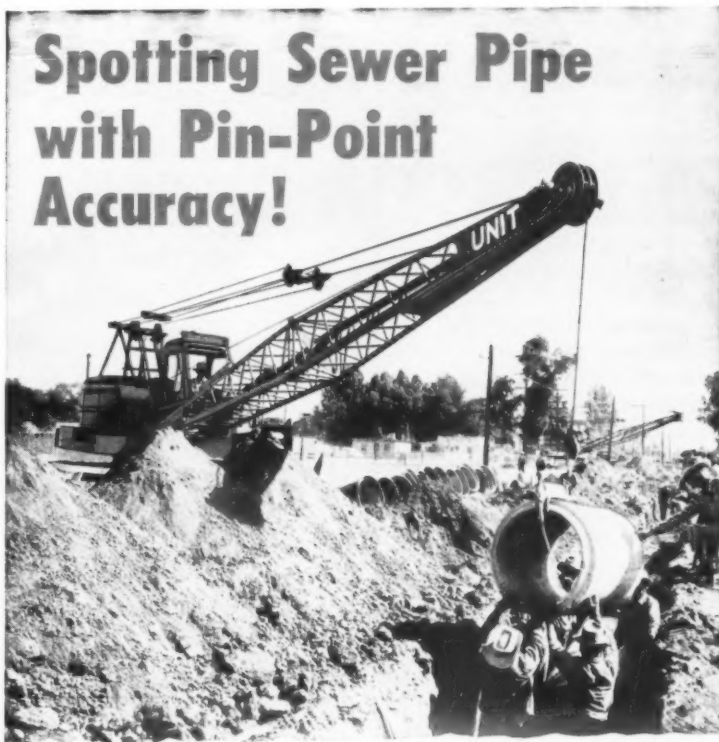
ledger, should be followed by the first and second numbers of the code. If Number 5 indicates substructure footings, and Number 7 reinforcing, then a drawing on an "A" sheet for this work might be numbered 1879/2025-5-7.

Each size tracing should be filed in separate drawers. On large jobs the file clerk will issue and receive all tracings, and the Drawing Number Ledger will be used only to record and issue drawing numbers. It is not to be used to record the movement of drawings.

Drawing Process Record

Once an engineer or draftsman has been given a block number for a drawing, the movement and progress of the work on the drawing is recorded on

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A Typical BUSY WORK DAY for WISCONSIN Air-Cooled ENGINES



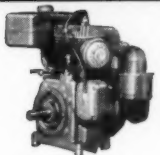
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- 2 Wisconsin-powered Mixer
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It's a rare construction job on which you won't find one or more Wisconsin Heavy-Duty Air-Cooled Engines "giving their all" to keep the work moving on schedule, of which the above application is typical, working in a remote, dry area of the West...delivering top performance at lowest maintenance and operating costs.

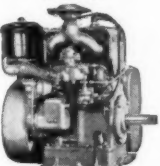
Because of their basic high torque design and heavy-duty construction, all Wisconsin Air-Cooled Engines, from the smallest to the largest, are especially suited to all forms of construction service where dependable, rugged Lugging Power is a "must".

Thrust-absorbing tapered roller bearings at BOTH ends of the crankshaft assure smooth running and provide greatest protection against bearing failure. All models are equipped with rotary type high tension OUTSIDE magneto, with Impulse Coupling for quick starts in any weather. A large capacity fan, integrally cast with the flywheel, maintains efficient AIR-COOLING at all temperatures up to 140° F. All models can be equipped with electric starting (starter and generator or starter only).

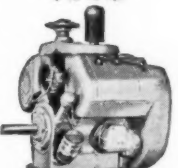
These are a few of the reasons why leading builders of construction equipment give the nod to Wisconsin Engines as the most satisfactory power to fit both the machine and the job. You can't do better than to specify "Wisconsin Power" for your equipment. Write for Bulletin S-188.



4-cycle single cyl., 3 to 9 hp.



2-cylinder 7 to 15 hp.



V-type 4-cyl., 15 to 36 hp.



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the Drawing Process Record, which is maintained by squad leaders of the chief draftsman. The information to be posted on the record is secured by referring to the Drawing Work Sheet, figure 2, which gives a detailed breakdown of the hours spent on the drawing. This is prepared by the chief draftsman and given to the squad leader for posting. All spaces—including that for the time needed to complete the drawing—should be filled out at this time.

The Drawing Process Record and the Drawing Work Sheet show the chief engineer the progress of each drawing being made. This is particularly important where several hundred men are working on drawings, for one or many projects, under central supervision. On smaller work a card system will be enough to record this information.

Record of Drawings

When a drawing is ready to be issued, the information is set down in the Record of Drawings, which contains a separate sheet for each drawing number. If the engineering department is on the site, it will maintain the only set of drawing required. If it is off the site, a duplicate set of records should be kept in the field.

All plans are issued for some specific purpose—"Preliminary", "For Approval", "For Subbids", "For Construction", and so on. These may be original issues or revised issues, and any may be cancelled and superseded by other drawings.

Since a drawing is usually issued with some information relating to it, some firms rely on a letter to state the purpose for which drawings were sent, together with any other special information that may be necessary. But letters do not lend themselves to systematic routine and recording. A printed Drawing Issue Bulletin, carrying all this essential information, can be filled out in pencil and copies sent to interested persons. Carbons of various colors can be keyed to different departments. The bulletin may also be sent out in duplicate so that one copy can be returned, with the signature of the person receiving it, to serve as an acknowledgement of receipt.

The bulletin should describe all revisions, the date of issue, drawing specification numbers, and any other pertinent information. The names of all persons sent the bulletin should be noted on the issue.

All preparatory work is performed automatically by the staff, and only the checking and signature of the executive under whose name the drawings are mailed out is required. The office copy of the bulletin can be filed in the Bulletin Register in numerical order for easy reference. When drawings are ready to be issued, they are stamped on the back with the date of the issue and the number of the bulletin being attached.

Drawing Record Ledger

As drawings, bills of material, or specifications relating to a drawing are received at the field office, they

should be stamped on the back with the date received before being recorded in the Drawing Record Ledger. Bills of material and specifications comprising numerous sheets can be posted on the same page in the drawing record ledger as long as they are properly identified. A separate sheet is maintained for each sheet of the drawings, however. This record is maintained for everything received, regardless of whether it comes from the main office, from subcontractors, vendors, manufacturers, architects, or engineers. It may be subdivided into sections by index tabs, or subdivided by using the 28 single-number subdivisions of the cost code. Indexing should be simple enough to enable anyone to locate a ledger sheet quickly. Sheets in this ledger will show

the names of the persons to whom prints have been given, the number of prints issued, and the date they were issued.

If plans are issued from the field office to foremen and subcontractors, a bulletin should also accompany them. When prints are voided, the information should be entered in the Drawing Record Ledger so that all prints may be accounted for. Voided prints should be returned. If they are not, the file clerk will know that a print is missing and notify the superintendent, who will make sure it is not being used in the field.

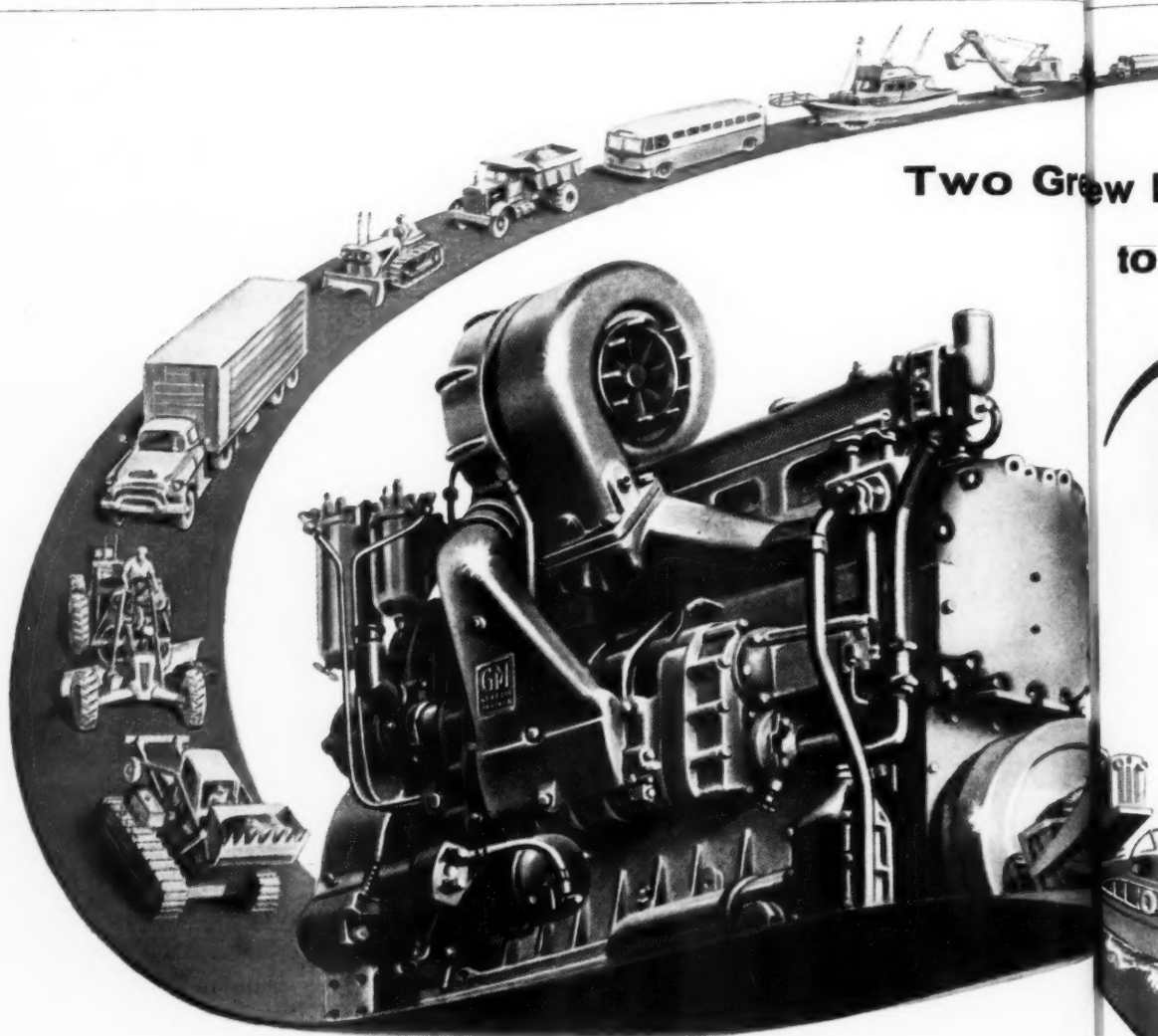
Process charts

These forms and procedures will, naturally, have to be modified or revised to meet specific job or company

requirements. But they should point the way to the need for routine procedures that will help to control the preparation of drawings and the recording and issuing of drawings, blueprints, and specifications.

A process chart, which plots every move of a paper or document connected with one operation, may help the contractor to establish standard practice procedure for a particular operation. Such charts are used mostly in making an analysis of present and proposed field operations, but it also serves as a valuable tool for studying office procedures. One such chart, shown in figure 3, gives the movements involved in preparing a standard drawing.

This chart uses four symbols. The large circle is an "operations symbol",



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Detroit Diesel engineers have Turbocharged 2-cycle Diesels by combining an exhaust-driven turbine with the engine blower to deliver a larger supply

of fresh air to the cylinders. Result: improved combustion, freer engine breathing, quieter and more efficient performance in the higher speed ranges.

Turbopower Diesels are additions to Detroit Diesel's time-proved Series 71 line, world's most widely used Diesel engines. The four-cylinder Turbopower Diesel delivers 171 H.P. at 2300 R.P.M.; the six-cylinder engine produces 280 H.P. at 2300 R.P.M.

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AMERICA'S LARGEST BUILDER OF DIESEL ENGINES

the smaller circle denotes a movement from one point to another, the triangle shows temporary or permanent storage or delays, and the square stands for checking and inspection. With these symbols, a complete analysis of any operation can be made. Opposite the symbols are spaces for filling in the time required to complete any specific part of this operation or the distance material is moved. Once present operations have been charted, the chart can be studied to find out which steps can be eliminated to save time and work.

This particular chart shows that the squad leader had to move 60 feet to secure a tracing number, and that there was a 26-minute delay waiting for final approval.

When a class of work being done in

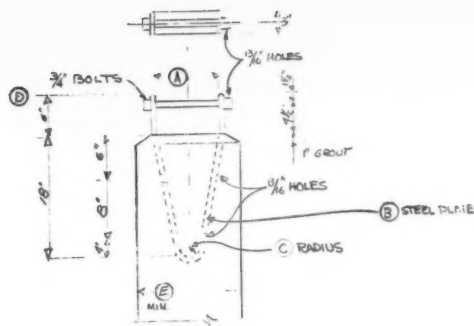


Figure 4

POST CONNECTION

POST SIZE INCHES	TABLE OF DIMENSIONS				
	SYMBOL				
4	A	B	C	D	E
6	3 3/4"	5 1/2" x 3-3/4"	1"	6" LONG	8"
8	5 3/4"	7 1/2" x 5-3/4"	1 1/4"	8" LONG	10"
10	7 3/4"	9 1/2" x 7-3/4"	1 1/2"	10" LONG	12"
12	9 3/4"	11 1/2" x 9-3/4"	1 3/4"	12" LONG	14"

the drawing room can be split up into standard classifications, a list of standards might be prepared. These standards may be established for any type of work, but their preparation is justified only where the design is repeated often enough to warrant the time and expense of setting up such a system. For example, copies of standards for steel windows, which are made in definite sizes and shapes, can usually be obtained from a specific manufacturer or manufacturer's association. Numerous textbooks, illustrating architectural standards as a guide to detailing, may be purchased. One very good volume is "Architectural Graphic Standards", by Charles George Ramsay and H. R. Sleeper, which is published by John Wiley & Sons.

Architectural standards as prepared in the drawing room are usually made on 8 1/2 x 11 inch "C" sheets so they can be inserted in the draftsman's looseleaf book. Figure 4 shows such a drawing for a concrete post standard. Standards can also be set up for equipment piping assembly, construction equipment, and other items.

Since the engineering department is often called upon to make sketches for the prefabrication of piping and other shop items, the work should be set up so that it can be handled in a routine, efficient manner.

In the past, sketches were prepared and bills of material taken off by the piping foreman. The material was purchased, and erection started in the field with only part of the material on hand. When a shortage of material developed, work was stopped. The result was that some piping was erected and hung on wires temporarily until the balance of items needed for the work could be secured. All this resulted because the material takeoff was inefficient.

With modern techniques, the fabrication sketches are prepared and the material billed by trained engineers. The materials are purchased and checked off the bills, and no work is started in the field until all materials are on hand. All of it is then turned over to the piping crews, which have only to concentrate on erection.

(Next month's article will deal with "The Engineering Department—The billing of materials".)

Truck-cover plan

■ A plan for a demountable pickup truck cover that can double as a contractor's office is diagrammed in a folder from Masonite Corp. The all-wood cover can be erected at a materials cost of approximately \$100. Views of the cover include a construction perspective, cross section, window construction, side-window assembly, joint and fastening details, door section, and overhang detail. The approximate amount and kind of materials—lumber and rib framing—as well as their size, length, and description, are incorporated into a chart.

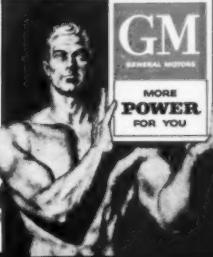
To obtain No. AE-321 write to Builders Service Bureau, Masonite Corp., 111 W. Washington St., Chicago 2, Ill., or use the Request Card at page 18. Circle No. 9.

Grew Engines Added

to General Motors 2-cycle Diesel Line

Detroit Diesel Turbopower





DETROIT DIESEL

Engine Division
of General Motors
Detroit 28, Michigan

In Canada:
GENERAL MOTORS DIESEL LIMITED
London, Ontario

Case history: Lakeland Construction Co., Inc., Waukesha, Wis., has used this treated plywood form panel on four jobs and for countless pours. The surface of the panel is free from scars and fuzzy grain ends, the contractor reports, because the panel is treated with Form-Kote after every few uses. Lakeland estimates its forming costs have been cut 22 per cent through the use of Form-Kote. For more information on this form coating write to **Form-Kote, Inc.**, 700 W. Virginia St., Milwaukee 4, Wis., or use the Request Card at page 18. Circle No. 211.



Drillers Save time and money with **HOFFMAN BITS**

"The Oriented Diamond Bits"

... that set new records for low footage costs

Yes, Drillers who use Hoffman "Oriented Diamond" Bits are bringing up better cores from farther down—and they're doing it faster and easier than ever before. They know that Hoffman Bits last longer and use less power because they cut on a negative rake, with only the sharpest, hardest diamond cutting edges exposed to the work. Miniature Bits for prospecting—Tapered Step-Core Bits for simultaneous drilling and reaming—Special Core Bits for air and mud drilling are a few of Hoffman's complete line of bits "designed to fit the job".

Write Today For Illustrated Catalogue — **FREE**

Hoffman Drilling Crews are also available for fast, efficient service on Contract Drilling Jobs.

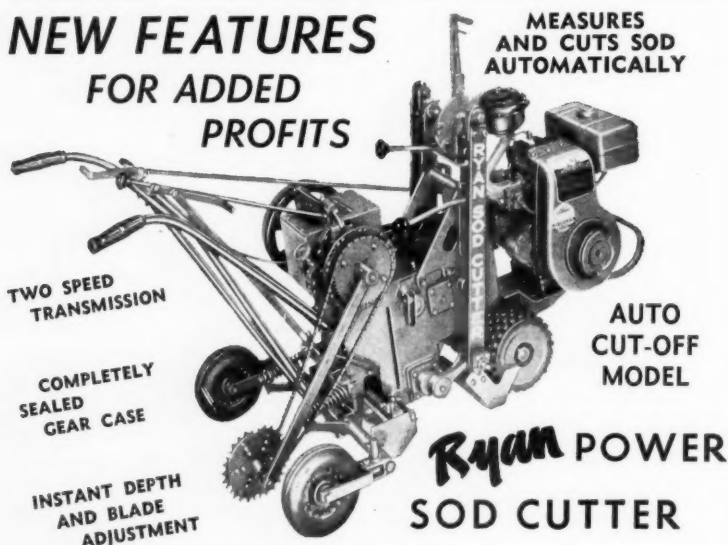


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BOX 426, PUNXSUTAWNEY, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 541

NEW FEATURES FOR ADDED PROFITS

MEASURES AND CUTS SOD AUTOMATICALLY



Designed for ruggedness and dependability, the Auto-Cut-Off Model with instant depth and blade adjustment, two-speed transmission, completely sealed gear case and increased engine horsepower... features that make RYAN now, more than ever, the finest power sod cutter in the field.

Write, wire or phone for complete information and name of nearest dealer.

Ryan landscaping
Quality Built

Division of **M&M Machine Works, Inc.**

Dept. K1, 871 Edgerton St., St. Paul 1, Minn.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 542

Phone: VAN Buren 8876

Ryan POWER SOD CUTTER

Complete tandem-axle, six-wheel truck line

■ The Dodge Division of Chrysler Corp. has announced a new line of tandem-axle six-wheel trucks ranging from 31,000 to 46,000 pounds maximum gross combination weight. New V-8 engines with up to 220 horsepower move the new line.

The new Model KX is powered by a 201-hp V-8 engine with 331-cubic-inch displacement. It is offered in wheelbases of 141, 153, 171, and 189 inches, and has a maximum gross weight rating of 31,000 pounds and a maximum gross combination weight rating of 45,000 pounds. The rear-axle bogie capacity is 22,000 pounds, with 28,000 pounds offered as extra equipment.

The Model TX is powered by a 212-hp V-8 engine with 331-cubic-inch displacement and twin carburetion. It is offered in wheelbases of 144, 156, 174, and 192 inches. The maximum gross weight rating is 36,000 pounds and the maximum gross combination weight rating is 55,000 pounds. The rear-axle bogie capacity is 28,000 pounds.

Powered by a 220-hp V-8 engine with 354-cubic-inch displacement, the Model YX is offered in wheel bases of 144, 156, 174, and 192 inches. It has a maximum gross weight rating of 46,000 pounds, a maximum gross combination weight rating of 65,000 pounds, and a rear-axle bogie capacity of 34,000 pounds, with 38,000 pounds offered optionally.

The new tandems are offered with five-speed transmissions as standard equipment. Available as factory-installed extra equipment is a complete line of three-speed auxiliary transmissions.

For further information write to the Dodge Division, Chrysler Corp., 7900 Jos. Campeau, Detroit 31, Mich., or use the Request Card at page 18. Circle No. 103.

The officer takes post in national credit group

The assistant treasurer of the Thew Shovel Co., Lorain, Ohio, Ralph A. Reynolds, has been elected chairman of the National Construction Machinery Credit group for 1956. He had previously been a member of the executive committee.

The group is affiliated with the National Association of Credit Men and includes a membership of 50 leading manufacturers of construction machinery.



The new line of tandem-axle, six-wheel trucks announced by Dodge has new V-8 engines ranging up to 220 horsepower. Capacities range from 31,000 to 46,000 pounds maximum gvw.



99 ft. Continuous Pour Using Richmond Tyscrus Believed Record

M-C & S designs forms for pour without interruption

What is thought to be the highest continuous pour in the area was made by Merritt-Chapman & Scott on its pier construction for the Newark Bay Bridge. For each of the 57 piers, forms were designed for a 10' liquid head and were set to the full height of the pour. Richmond Tyscrus were used throughout; 123 1" 4-strut Richmond Tyscrus holding the highest placement—99' 9 3/4". Concrete was poured to the maximum design strength of tie rods and forms, and every column went up without incident.



For speeding all types of concrete form work, the extra safety margin of Richmond Tyscrus counts heavily. Strength of Richmond Tys far exceeds their published load. For instance, rigid performance tests show that 1" 4-strut Richmond Tyscrus (published safe load strength 24,000 lbs.)—identical with those used on the Newark Bay Bridge—actually test out at 38,000 lbs.

Hangers, Sereed Chairs, Lagstuds and all Richmond equipment are made with the same professional attention to the contractor's needs as are Richmond Tyscrus. Write for the 1956 Richmond Catalogue which details Richmond products and their many uses. It can save you time and money on your next job. Address:—RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y., or 315 South 4th Street, St. Joseph, Mo.



For more facts, circle No. 543

CONTRACTORS AND ENGINEERS



◀ Traveling in fourth gear the Pioneer Vibromatic bituminous paver pushed 14-ton hot-mix trucks uphill at 53 fpm while laying a 2-inch mat.

Case history

Paver easily pushes 14-ton hot-mix truck

Making its California debut handling a 4.6-mile bituminous paving job on the Foothill Freeway near La-Crescenta, Calif., a new asphalt-paving machine manufactured by Pioneer Engineering Works, Inc., easily pushed a 14-ton hot-mix truck up a 600-foot 2.75 grade in fourth gear without lugging down while laying a 2 inch mat at the rate of 53 fpm.

The test demonstration was made by Cook Bros. Equipment Co., Los Angeles, Calif., in conjunction with Schroeder & Co., Sun Valley, Calif., asphalt paving contractor on the job. The new paver is the Pioneer Vibromatic.

Following the demonstration, John Sawyer, general superintendent for Schroeder, remarked, "Frankly, I was favorably surprised. So was our lay-down-machine operator. He got on the machine and ran it perfectly . . . without previous instruction."

In a two-week comparison between the Vibromatic paver and an older Pioneer model, both rigs operated alternately by the same crew, it was concluded that the new paver was quieter and its hydraulic steering controls delivered smoother edges without abrupt jogs. Top speed for the old machine was 37 feet per minute,

while the Vibromatic reached a high of 65 feet per minute on level ground.

For more information on the paver write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 200.

Tractor with loader

■ The Caterpillar No. 977 Traxcavator with a 2¼-cubic-yard-capacity bucket and a 100-hp engine is featured in a folder from the manufacturer. The bucket has a 40-degree tipback for loading, and a discharge angle of 50 degrees. Parts shown and described are the tank-protected valves, automatic kick-outs, hydraulic system, oil clutch, and operator's con-

trols. Complete specifications are given.

To obtain Form No. 31913 write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 37.

Dock construction

■ The De Long Corp.'s method of dock construction is described in a catalog from the company. The steel dock can be fabricated anywhere, according to the catalog. After fabrication, it is towed to the installation site, together with the De Long jacks and other equipment.

To obtain the catalog write to the De Long Corp., 29 Broadway, New York 6, N. Y., or use the Request Card at page 18. Circle No. 131.

How to Set Down Only One Pound of a Nine-Ton Load!

Hydrocrane Does It with Precision Hydraulic Control



Take a good look at this remarkable demonstration of Hydrocrane control, then picture a Hydrocrane at work for you. For setting beams or concrete slabs, pouring cement or setting a plate glass window — any job that requires hairline control — nothing can beat the Hydrocrane in saving you time and money.

The all-hydraulic Hydrocrane is an expert at working in close quarters, too. It has the shortest tail swing, size for size, of any revolving crane, and its unique telescoping boom can reach out and poke a load into hard-to-get-at places.

Contractors who own Hydrocranes call them, "the handiest machine we have." You'll say so too when you get all the facts from your Bucyrus-Erie distributor. Do it soon.

SEEING IS BELIEVING!

The experiments shown here were made with a standard 9-ton capacity H-5 Hydrocrane at Bucyrus-Erie's test and research grounds near South Milwaukee. The sled and billets, being lifted, totaled 18,363 pounds when weighed on a certified scale. Note that this is the *maximum rated lifting capacity* for this crane — hardly favorable conditions for such a test!

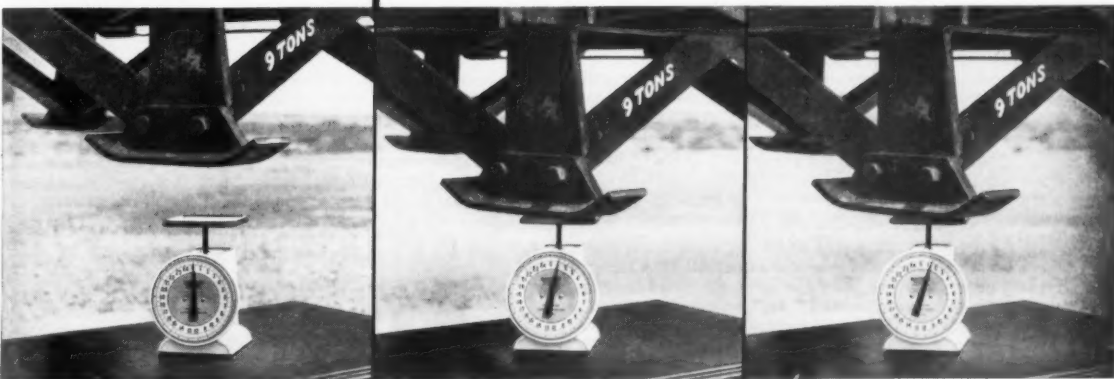
114H36

H-3 HYDROCRANE • 4-ton, ¾-yard

H-5 HYDROCRANE • 9-ton, ½-yard

**BUCYRUS
ERIE**

South Milwaukee, Wisconsin



2 Closer and closer it comes. No jerks — just a carefully controlled movement as load nears scale.

3 Contact! And so-o-o easy that scale registers only one pound of that big 9-ton load. That's precision control in action!

4 Now the operator "feathers" his control lever a hair, and look — the scale pointer moves to a pound and a quarter!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 545

BERRY'S RUBBERIZED ASPHALT

**THIS FOLDER
CAN SAVE
YOU
THOUSANDS
OF DOLLARS
IN ROAD
CONSTRUCTION
AND MAINTENANCE**

YOU WILL SEE HOW rubber and asphalt have been successfully blended to form an all weather sealcoat — how the adhesiveness and resiliency of rubber have been retained in the exclusive Berry blending process — why Berry's rubberized asphalt is less susceptible to temperature, holds more aggregate, saves on bitumen and requires far less maintenance.

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For more facts, circle No. 544



THE LARGEST TANKS formed as monolithic units, according to record, are these three 100 x 22½-foot digester tanks for a San Jose, Calif., sewage-disposal plant. More than 10,000 square feet of Uni-Form panels were used for the job, which was supplied with concrete by Worthington ready-mix trucks.



WORK REACHES THE SUPERSTRUCTURE STAGE on the Delaware River Bridge, which will provide a direct connection between the New Jersey and Pennsylvania Turnpikes. Working here is an Insley 35-ton-capacity type-WB truck-crane, powered by a GM 471 diesel engine.

TDA® BRAKES

if it moves...we can stop it



longer life with genuine
factory brake replacement parts

Only genuine factory replacement parts are a true match in quality for the original equipment. A major reason for Timken® brake superiority is the care and precision with which every part is produced. These same exacting standards assure equal superiority in Timken-Detroit® brake replacement parts. Each TDA replacement part is rust-proofed, heat-treated or conditioned as required to meet original equipment specifications. This assures the same long-lasting, trouble-free service as the original part.

Save on man-hours and maintenance! All TDA factory replacement parts are identical with the original. This assures "original equipment fit" for every installation... makes certain replacement is fast and easy.

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Remember, only the authorized dealer or branch of your original equipment manufacturer is equipped and qualified to supply you with the genuine high standard replacement parts you need for efficient maintenance.

For expert consultation on any brake problem, contact the Timken-Detroit Brake Division. A staff of experienced engineers is ready to assist you without cost or obligation.

For every industrial, agricultural or automotive application where braking is required.



TDA Plants at: Detroit, Michigan • Ashkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 546

Civil Service jobs open at bases in Pacific Ocean

Engineering positions at U. S. Navy installations in the Pacific Ocean, particularly on Guam and the Philippines, are now available to qualified engineers. All candidates must be citizens of the United States or owe allegiance to the United States, and must have a degree in engineering from an accredited college or university along with professional experience.

Applicants may also qualify if they have at least four years of successful and progressive experience in engineering, but do not have a degree. No written test is required.

Further information and application forms may be obtained from any post office or from the Civil Service Commission, Washington 25, D. C. Applications are being accepted by the Navy Board of U. S. Civil Service Examiners for Pacific Overseas Employment, 45 Hyde St., San Francisco 2, Calif., until further notice.

BUY BIG ORANGE AND YOU BUY THE BEST

Shackle Chain HOOKS

Use on "HIGH TEST" Chain
EXTRA STRONG

Even the pin is made of hi-strength steel and heat-treated.



GRAB HOOKS
Available for Chain Sizes 1/4" 5/16" 3/8" 7/16" 1/2" 5/8"

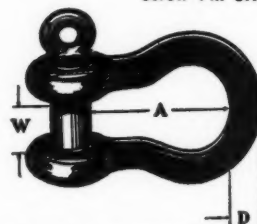


SAVES TIME
Can be attached anywhere on the job. Only a pair of pliers needed.

SLIP HOOKS
Available for Chain Sizes 1/4" 5/16" 3/8" and 1/2"

ANCHOR and CHAIN

Screw Pin SHACKLES



Forged of HI-STRENGTH STEEL
Available in sizes 1/4" to 2". **EXTRA STRONG**
—EXTRA TOUGH. Self-colored or galvanized
Order from your Distributor or Write
MIDLAND INDUSTRIES, INC.
Cedar Rapids, Iowa

For more facts, circle No. 547

CONTRACTORS AND ENGINEERS



LOADING ROCK to a fleet of Euclids at a rate of 190 tons per hour, this Lorain shovel, powered by a GM 6-71 Detroit Diesel engine, fills an order for 300,000 tons of crushed rock being used on a Peter Kiewit Sons' Co. contract on the Kansas Turnpike.



JUNE AND BATHERS arrive simultaneously at shore resorts, so the maintenance section of the Atlantic City Department of Public Works has an International TD-14 hooked up to a 20-foot half-ton steel I-beam to keep the beach clean. The drag operation is done over a 500-foot-wide and 1½-mile-long stretch daily.

Line of campcars

■ A line of dormitory, kitchen, office, and storage campcars manufactured by Morrison Railway Supply Corp. is shown in a catalog. Pictured or diagrammed are the 19 to 22-man dining and recreation car, the 8-man dormitory, and the combination kitchen and dining car. The units can be towed by vehicles operating on either 6 or 12-volt systems.

To obtain this catalog write to Morrison Railway Supply Corp., 1437 Bailey Ave., Buffalo 12, N. Y., or use the Request Card at page 18. Circle No. 11.

Hyster Co. promotes

The Hyster Co., industrial truck and tractor-equipment manufacturer of Portland, Oreg., has promoted Raymond L. Howerton to the post of assistant manager of the sales promotion department. He was formerly manager of the firm's sales training division.

FOR SALE
OR
RENT



TRANSITS
& LEVELS

You will find the best bargains at Warren-Knight.

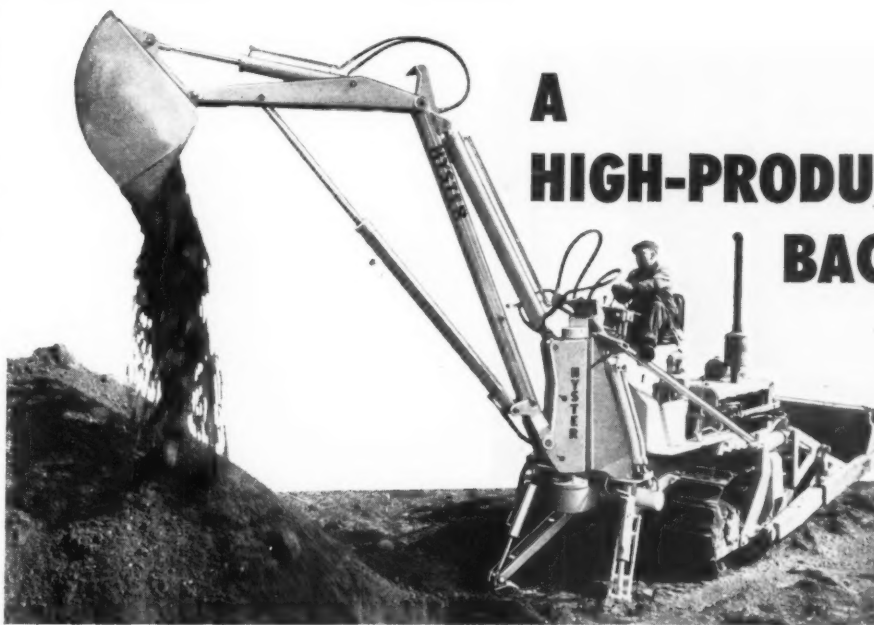
- New or rebuilt transits and levels—for sale or for rent.
- We will buy or trade your used transits, levels, alidades, etc.
- Send your instruments for valuation.

Write for free information EC-66 of instruments, field equipment and drafting room supplies.

Send for free information EC-66



For more facts, circle No. 548



A HIGH-PRODUCTION BACKHOE

plus

- 3 Dippers Available — 13", 21" and 29" cutting widths
- Digs to 13' 6"
- Loads to 9' 7"
- 240° Swing
- Retractable Hydraulic Outriggers
- Convenient Controls
- Full track oscillation

BULLDOZER



One machine does all these jobs:

- Clears the way to the job site
- Clears and rough grades the area
- Levels its own footing for accurate digging
- Trenches for water, sewer and gas lines
- Excavates for fuel tanks, septic tanks and foundations

All these add up to one point:

You get more work out of *one* machine and reduce your operating costs. For details write for Form 1437 to Hyster Company, 2952 N.E. Clackamas St., Portland 8, Ore., or 1852 N. Adams St., Peoria 1, Ill.

Your Caterpillar Dealer will show you how the Hyster D4 Backhoe will increase the work capacity of your Caterpillar D4 Tractor.

*Caterpillar is a registered trademark of the Caterpillar Tractor Co.

More jobs are "One-Machine" Jobs for the HYSTER HYDRAULIC D4 BACKHOE

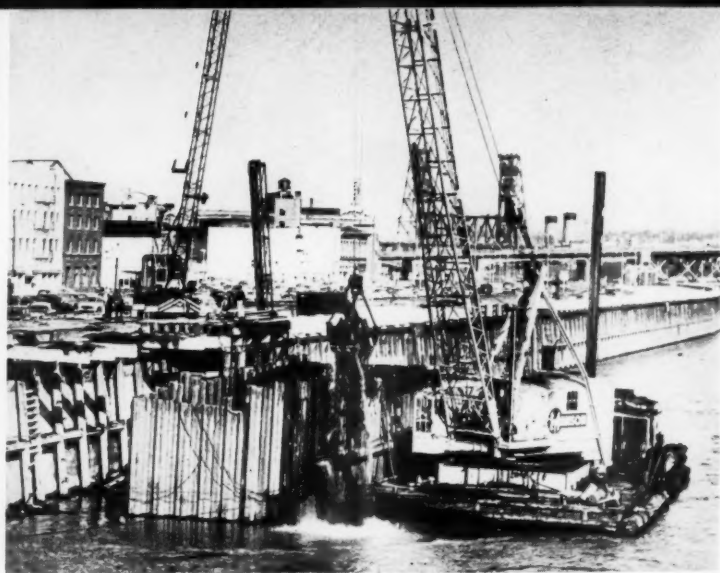
Designed specifically for the
Caterpillar* D4 Tractor

HYSTER COMPANY

THE HYSTER D4 BACKHOE
MAKES MORE JOBS
"ONE-MACHINE" JOBS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 549



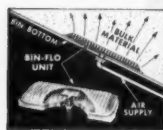
PILE DRIVING AND EXCAVATION are done alternately on a cofferdam for a bascule bridge on the Willamette River, Portland, Oreg., by Manson Construction & Engineering Co., Seattle, with a scow-mounted Colby crane. A Vulcan 50C steam hammer drove about 280 tons of L. B. Foster steel sheet piling for the coffer.



A RIPPER TOOTH at the end of an 18-foot extension on a Gradall boom removes rock from a steep slope along Topanga Canyon Blvd., in San Fernando Valley, Calif. On this tricky grading job, a 100-foot fill area changed to a 160-foot cut within a distance of 200 feet.

BULK MATERIAL CONTROL under Pressure or Vacuum

New Roto-Bin-Dicator mounts outside bin, at any angle, for bin level signaling or machinery control. Material loads on paddle actuate Micro switch in motor housing. Flexible paddle shaft permits use with large or lumpy materials when standard diaphragm indicators are impractical.



Low pressure air diffuser assures steady flow of fine, dry materials that tend to pack in storage.

BIN-DICATOR
BIN-FLO AERATOR

The original diaphragm-type bin level indicator for all ordinary applications.

Complete Illustrated Literature FREE

THE BIN-DICATOR CO.
13946-M Kercheval • Detroit 15, Mich.
Phone: VAlley 2-6952

WE SELL DIRECT • PHONE ORDERS COLLECT

For more facts, circle No. 550

Garrison power steering makes Lorain Truck Cranes steer easy in any terrain!

You can't beat Garrison Power Steering for taking the work out of steering heavy, wheeled equipment. A rugged, hydraulic power cylinder does 80% of the work of wheel turning, yet the operator experiences normal "road feel" at all times. Maneuvering in sand, rubble, or in cramped quarters is quickly accomplished with only the slightest pressure on the steering wheel. Equipment is positioned quicker; more work is done in a given period.

Garrison Power Steering is available for most makes and models of trucks, and wheeled tractors and off-the-road equipment. Ask your Garrison distributor for complete information or write direct.

Now available as standard equipment on Thew-Lorain truck cranes, Models 524 and 425; or as optional equipment on Models 424 and 254. Kits for all models are also available for field installation.



1500 South Santa Fe Avenue, Los Angeles 21, California

For more facts, circle No. 551

Six-wheel-drive carriers for off-highway travel

■ Two ready-mix concrete trucks, featuring six-wheel drive and designed especially to facilitate delivery of concrete to off-highway locations where terrain is rugged or soft, have been introduced by the Four Wheel Drive Auto Co.

The new FWD carriers are the Model C6-407, a conventional-cab unit with a 10,000-pound-capacity front axle, capable of carrying up to 7 cubic yards of concrete, and the Model CS6-457, which has a one-man cab and a 15,500-pound-capacity front axle. The latter model can transport up to 8 cubic yards of concrete, and is engineered for increased legal payloads in areas where rear tandem limits are low but gvw limits are liberal.

The FWD six-wheel drive featured on both mixer carriers distributes torque to three driving axles by means of a patented, power-proportioning, center differential design, with a separate propeller shaft to each axle. This power-splitting arrangement sends 1/5 of the engine torque to the front driving axle and 2/5 to each of the rear driving axles, thus dividing the power in proportion to the weight distribution and the tire capacity.

For further information write to the Four Wheel Drive Auto Co., Clintonville, Wis., or use the Request Card at page 18. Circle No. 97.

Electric plants

■ Reference material on electric plants for heavy construction use is given in a folder from International Ferment Machinery Co., Inc. Selection factors listed for any electric plant include kilowatts, power factors, phase, types of alternator and prime-mover, controls, type of starting, fuel storage and supply, and ventilation. Specifications for a kilowatt electric plant are given, and charts of the gasoline and diesel-operated Ferment plants give data on their capacity, engine data, and approximate weight and dimensions.

To obtain Bulletin No. 955 write to International Ferment Machinery Co., Inc., Ramapo, N. Y., or use the Request Card at page 18. Circle No. 3.

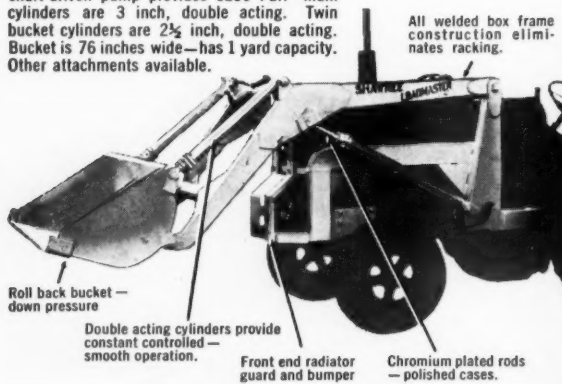
Cut costs with SHAWNEE

NEW SHAWNEE "SCOUT" BACKHOE MODEL D70HL

Now designed with hydraulic "feet" for quick leveling-up to dig plumb holes, new D-70-HL is ready for work seconds after the tractor stops rolling. Working on slopes or with one wheel on a curbing makes no difference.

SHAWNEE LOADMASTER Lifts 4,000 Lbs. to 9 ft. dumping height

For the big, heavy jobs, the "Loadmaster" moves material fast and easily. 20 GPM crankshaft-driven pump provides 1200 PSI. Main cylinders are 3 inch, double acting. Twin bucket cylinders are 2½ inch, double acting. Bucket is 76 inches wide—has 1 yard capacity. Other attachments available.



Roll back bucket—down pressure

Double acting cylinders provide constant controlled—smooth operation.

Front end radiator guard and bumper

Chromium plated rods—polished cases.

Exclusive, patented drag line principle produces digging force of approximately 6,000 lbs. at bucket teeth.

Patent Numbers: 2,669,367 and 2,682,346

6-bank, free-flowing valve system—can operate 2 or more at once.



Zerk fittings at all wear points.

Bucket widths—12" to 24" inclusive. Flat bottom buckets 32" and 36"

DIGS 12 FT. DEEP — LOADS 8½ FT. HIGH

NEW INDIVIDUALLY CONTROLLED HYDRAULIC STABILIZERS

Write For COMPLETE INFORMATION

SHAWNEE MANUFACTURING COMPANY, INC.

1947 M North Topeka Avenue, Topeka, Kansas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 552

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NOT WORK ON A FARM, but regrading of a farm-to-market road near Jerico, Iowa, is being done by this Caterpillar D7, push-loading a Cat DW10 tractor-scraper. Grading, drainage, and structure work on the 5½-mile section is being handled by Eisheid Contracting Co., New Hampton, Iowa.



CONCRETE PLACED to a depth of 20 inches for a 1,000-foot touchdown strip at the Portsmouth Air Force Base, Portsmouth, N. H., is consolidated by ten Viber electric vibrators carried by the Blaw-Knox spreader. The units are powered by an International engine through a Palmer generator.

Engineers' transits

Two engineers' transits are detailed in a bulletin from the manufacturer, Buff & Buff Mfg. Co. Model No. 1-Ec has a 6¼-inch horizontal circle reading two verniers to single minutes on solid silver. There is a 12-inch telescope with large eyepiece and stadia. Model No. 1-c, of hard bronze and gradation solid silver reading to minutes, has a 5-inch diameter vertical circle of solid silver. The unit comes equipped with a detachable guard.

To obtain the bulletin write to Buff & Buff Mfg. Co., 329 Lamartine St., Jamaica Plain 30, Mass., or use the Request Card at page 18. Circle No. 13.

Easton appoints engineer

Easton Car & Construction Co., Easton, Pa., has named George Sines as chief engineer of the firm's industrial car division. Sines has been in the field since 1919.

FOR SAFE AND SPEEDY HOISTING

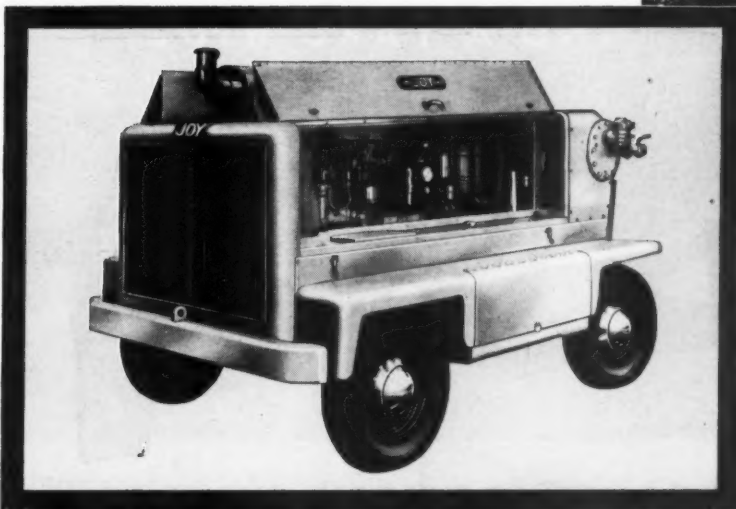
Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service. Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.



MADESCO
BLOCKS
MADESCO TACKLE BLOCK CO.
EASTON, PA.
Engineered to Serve
Your Special Service Needs

For more facts, circle No. 553

Not only **NEW** but
DIFFERENT



JOY

AIRVANE

ROTARY COMPRESSOR

Joy engineers started with all accumulated rotary information—then went on from there to produce, we believe, the best rotary compressor available today. These Joy developments contribute materially to a superior machine:

THERMAL BY-PASS Heats oil quickly, keeps it flowing into compressor at correct temperature—under all weather conditions. Efficient oil circulation system provides immediate lubrication (no dry starts).

SPLINE COUPLING Does away with a clutch, gives greater power-transmission efficiency. It's light, takes little space, is virtually indestructible.

TWO-STAGE FILTER-SEPARATOR Removes oil from air and returns it to circulation system so efficiently that oil consumption becomes a minor item.

ECONO-MISER load control automatically selects most efficient engine speed, maintains steady pressure, saves fuel, increases compressor life.

SHORTEST TURNING RADIUS Compact design and low center of gravity give the shortest turning radius of all rotaries. With light weight, this spells maneuverability.

OTHER FEATURES (often overlooked) Body is waterproof—tool box and fuel tanks can be locked—doors stay open without props—three lifting rings support entire machine—push-button uses ether-capsule for cold weather starting.

Write for complete information to Joy Manufacturing Company Oliver Bldg., Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Write for FREE Bulletin 69-21



Consult a Joy Engineer

for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS
PORTABLE HOISTS • FANS • BLOWERS • TUNNEL,
QUARRY, MINE EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 554

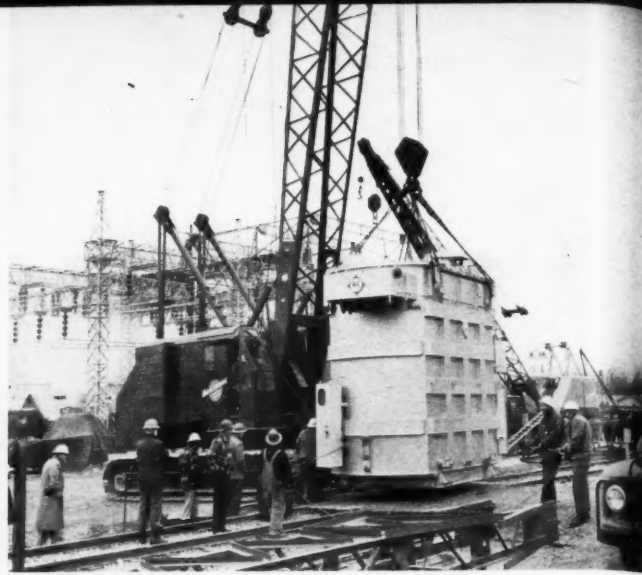
WSW C 6012-69



JOY
CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY



HIGH IN THE ROLLING HILLS near Chattanooga, Tenn., a Caterpillar D8 push-loads a Euclid 12-yard scraper in preparation for the realignment of the track and grade of the Southern Railway. Codell Construction Co., Winchester, Ky., has the contract for this job.



THOUGH IT INTERFERES with the radii of the crane, a big Allis-Chalmers transformer is set in place at the Arnold Engineering Development center at Tullahoma, Tenn., by a Manitowoc Model 3900 crane. This Air Force testing center is nearing completion.

ALL WELD

AND A YARD WIDE

That's YAUN'S 3 YD. BUCKET

ALL Yaun products are ALL-WELDED, for more strength, with less dead weight. Smooth welds on bottom give clean dumping. Manganese teeth and cutting lips give digging power that lasts, bite after bite, job after job, year after year. All Yaun buckets, drag or clam, have Manganese steel wherever they hit the load; they dig and dump fast and clean, and have long useful life.

Sold by equipment distributors world-wide.

YAUN MAKES

DRAGLINE BUCKETS

- Shell
- Basket
- Perforated

CLAMSHELL BUCKETS

CONCRETE BUCKETS

IN ALL SIZES.



Triple Tapered

FRONT TO BACK
TOP TO BOTTOM
SLOPING FLOOR

YAUN

MANUFACTURING CO.

BATON ROUGE, LOUISIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 555

Southern Pacific Milling advances two executives

Philip Holmes, the former northern division manager of Southern Pacific Milling Co., Montalvo, Calif., has been promoted to the position of vice president and general manager of the company. He will make his headquarters in Montalvo.

Holmes' former position as northern division manager has been assumed by Nicholas Savage. Savage will maintain headquarters at the firm's Santa Maria plant.

Motorola names manager of national sales program

Harold A. Jones has been promoted to the position of national sales manager of Motorola Communications & Electronics, Inc., Chicago, Ill. Formerly assistant to the national sales manager, Jones succeeds Eugene S. Goebel who has been named vice president in charge of market relations.



The answer to successful use of HIGH STRENGTH STRUCTURAL BOLTS

This impact wrench calibrator makes it easy to accurately tighten every bolt to specified tension. Permits on the job determination of wrench performance. Simple adjustments are then readily made to make the wrench stall when proper tension is reached.

ACCURATE—PORTABLE
RUGGED

PROMPT DELIVERY
WRITE FOR BULLETIN 102

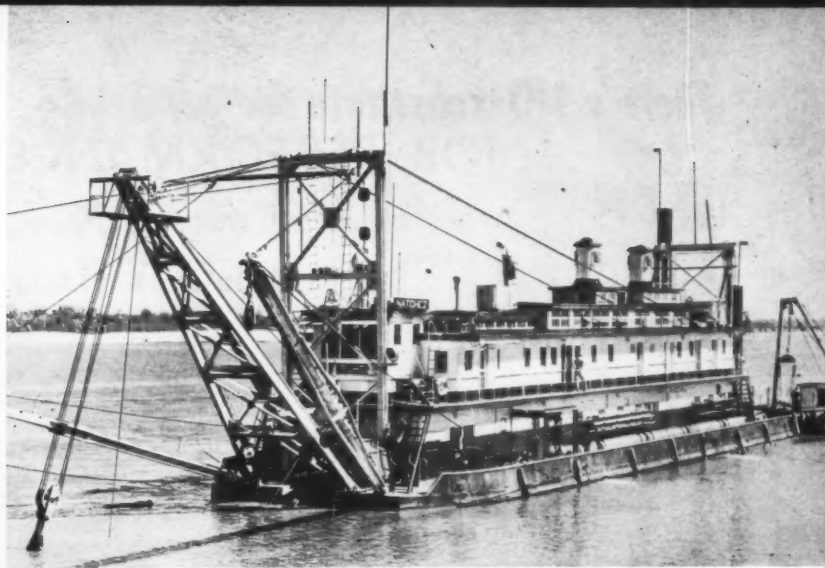
SKIDMORE-WILHELM
Manufacturing Company
442 Green Rd., Cleveland 21, Ohio

For more facts, circle No. 556

CONTRACTORS AND ENGINEERS



REMAINS OF AN OLD POWERHOUSE are included in the 420,000 yards of material being removed during construction of Chicago's Congress Street Expressway. Draglines, like this Bucyrus-Erie 51-B, powered by a Cat D1700 engine, load 1,000 cubic yards per 8-hour shift to Mack trailer trucks for removal.



ONE OF THE GIANT DREDGES converting 20,000 acres of swamp into solid ground for industrial development near New Orleans, La., is the Natchez, which is capable of pumping bottom material 1½ miles through a 28-inch line. McWilliams Dredging Co., New Orleans, will take a year to complete this \$3 million project.

Weight, tension controls

■ Measurement and control of weight and tension on lift trucks, suspension bridge cables, and other heavy equipment are detailed in a catalog from the manufacturer, Martin-Decker Corp. Models shown are the lift-truck scale, Tensiometer, crane-weight indicator, the Sensater lifting-hook scale, and a cable tension indicator.

To obtain this catalog write to The Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., or use the Request Card at page 18. Circle No. 5.

Mack Trucks appoints new sales representative

Mack Motor Truck Corp., a division of Mack Trucks, Inc., New York, N. Y., has named Stanley J. Coffey western sales representative for the company's line of off-highway equipment. From headquarters in Los Angeles, Calif., Coffey will handle fleet accounts among larger common carriers.

POWER SHIFT NO CLUTCH TORQUE CONVERTER



HUBER-WARCO 5D-190 (195 H.P.)

POWER!

Tough grading jobs are handled easily and quickly by this 31,450 pound motor grader, powered by a 195 h.p. General Motors diesel engine.

PERFORMANCE!

An Allison Torque Converter protects the unit from shock loads while a full power-shift transmission — WITHOUT CLUTCH — permits quick shifts under full load without interrupting power flow from engine to load. A tail shaft governor automatically adjusts engine RPM to meet any load condition, at any speed set by the operator. Power sliding moldboard is standard equipment.

PROFIT!

These power and performance features have been combined to increase the working capacity of the 5D-190 and reduce costly down-time. With this motor grader it is possible to move more material, with fewer passes. This increased working capacity will add more profit to every job.

For more information write for Huber-Warco 5D-190 literature — Bulletin HWG-508 and Bulletin HWG-510.

For More Details — See Your Huber-Warco Distributor

SEE YOUR NEAREST HUBER-WARCO DISTRIBUTOR



Road Machinery

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

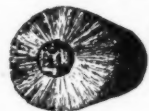
NOTICE TO BUYERS OF NEW ROTARY SWEEPER BROOM CORES

We Manufacture NEW Cores of the following types:

★ LITTLEFORD ★ DETROIT-HARVESTER
★ HOUGH ★ GRACE ★ ROSCO
★ FORDSON ★ SPEARSWELL ★ LULL
★ HUBER ★ MEILL-BLUMBERG

(Special Cores Made to Order)

We Rebuild Repair all Makes Types- Sizes



Immediate Shipment SAVE MONEY

Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

ROAD BUILDERS IT'S SENSATIONAL! !

BIG **PECKERWOOD** BIG

Steel (or Fibre) road drag levers Made in any c-o-n-t-i-n-u-o-u-s length up to 12 feet. 6 inches wide—kiln dried hardwood

NO FRAME REQUIRED

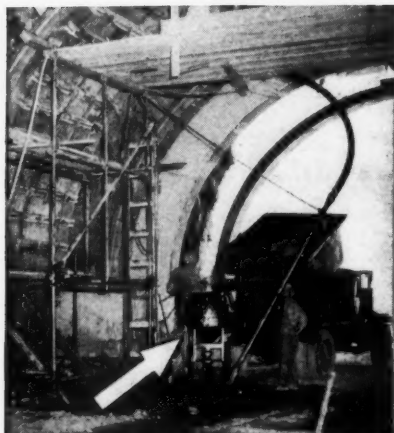
We offer also (not illustrated) The LITTLE PECKERWOOD unit steel wire drag 3" x 15". Fits standard frame

Road Contractors Headquarters Since 1928
VAN BRUSH MFG. CO., INC.
327 Southwest Blvd., Kansas City 8, Mo.

For more facts, circle No. 557

For more facts, use Reader-Reply Card opposite page 18 and circle No. 558

There's NO substitute for good JOB PERFORMANCE!



Precast Rings eliminated shoring and supported forms for lining the 280 ft. long tunnel in Mt. Rainier National Park. Then a

PREHY GROUTER & PLACER

speeded construction on Mt. Rainier Tunnel by placing concrete rapidly through openings in suspended forms. The equipment on this job was lighter and resulted in considerable savings in construction time, as compared with cast-in-place lining. Construction story ENR Dec. 22, 1955.

There is a type of Prehy Grouter and Placer for every job. Pressures from 15-125 psi.

Write for literature.

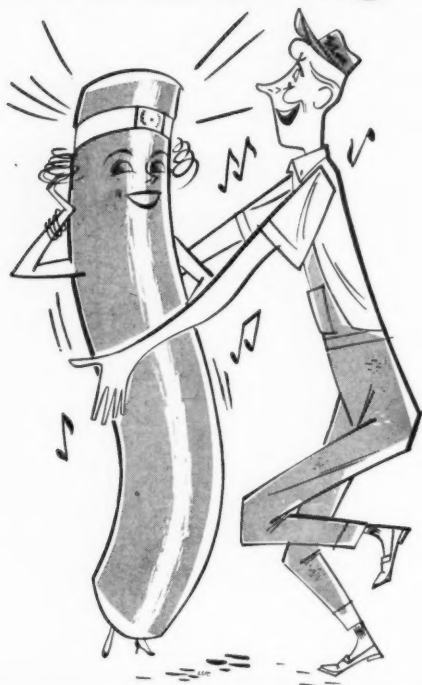


PREHY CO.

420 LEXINGTON AVE., NEW YORK 17, U.S.A.
Telephone: MUrray Hill 3-5568

For more facts, use Reader-Reply Card opposite page 18 and circle No. 559

Fascinating!



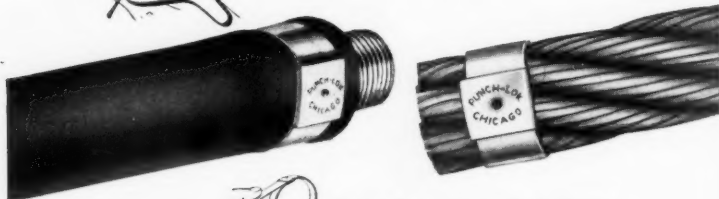
SHIMMY and SHAKE

once you choose it—
you won't loose it!

PUNCH-LOK HOSE CLAMPS



"Got vibration problems?" asks Doc Punch. "Call in a specialist—your nearby Punch-Lok distributor. He'll solve your problem in a hurry!"



"The sign of
a GOOD Hose Clamp"

Fastening hose or seizing tough
wire rope—Punch-Lok clamps
do the jobs with equal facility!

Write for complete product and price information.

PUNCH-LOK Company

5696

Dept. J, 321 North Justine Street • Chicago 7, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 560



New calculator simplifies cost-computing on jobs

**New Remington Rand unit permits flexibility
in accounting; proves economical machine
for field office, headquarters use**

by JOHN D. BERNARDO, Assistant Secretary-Treasurer
Darin & Armstrong, Inc., Detroit, Mich.

Working on such large projects as the construction of the Ford Tank plant in Livonia, three plants for Chevrolet, and a unit for the Chrysler Corp. convinced us that flexibility in our accounting system would greatly increase our over-all efficiency.

In a business involving large and complex jobs, we have to maintain close control of costs, and with individual contracts running into eight figures, we must know at all times the unit cost of each phase of the work. By checking unit costs from day to day, we can determine whether a job is running close to our estimate. If it is not, we can take steps to correct any serious departure.

We know, for instance, that so many bricks will be laid in a day, and we know how much we spend in payroll and indirect costs to get that work performed. From this, we can determine how much the work is cost-

ing us per thousand bricks and check that amount against our estimates. It is a simple matter of dividing the money spent by the units laid, but out in the field, we like to have the answer in a hurry.

We run into similar problems in most aspects of construction—in form work, cement-block construction, cost of scaffolding per square foot—and getting the answer to each could involve a time-consuming calculation on two units—an adding machine and a rotary calculator.

Operation is speeded

Important figuring is performed by the field-office manager whose direct operating responsibility for a project involves many diversified jobs. When we tested the Remington Rand 99 Printing Calculator, in field-office work, calculating the distribution of direct costs—such as travel-time

Anthes FLAME-GUARD

the torch with the
SQUARE BURNER

NEW!

Construction Torch



Designed and constructed by Anthes, a firm famous for torch and flare equipment in the trucking industry. Here is a unit that is leak-proof, self-righting, long-burning—and ruggedly made to perform faithfully under the most adverse weather conditions. Baked enamel body and burner. Chain for carrying. Write for complete data and prices. Anthes Force Oiler Co., Ft. Madison, Ia.

"The sign of a GOOD Hose Clamp"

Fastening hose or seizing tough wire rope—Punch-Lok clamps do the jobs with equal facility!

Write for complete product and price information.

PUNCH-LOK Company

5696

Dept. J, 321 North Justine Street • Chicago 7, Illinois

Anthes WEATHERCAP

The protector of engines with vertical exhaust pipes

Areas open for distributors.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 561

CONTRACTORS AND ENGINEERS



A field-office manager for Darin & Armstrong uses the Remington Rand 99 Printing Calculator to compute the distribution of direct costs. The Simpla-tape permits him to check each figure as it appears, making back-tracking unnecessary.

allowances to employees, and equipment-rental costs—we were so satisfied with the results that we installed the 99 in our field offices, each of which has a sufficient volume of work to make its use practical. Including the extra unit standing by ready for use, we now own a total of six Printing Calculators.

The relatively simple calculations are time-consuming without the proper mechanical equipment. When figuring equipment rental, we charge this to our customers in the same ratio as we charge direct labor. If we have a direct-labor charge amounting to \$19.91 on one work order, out of a total labor cost of \$2,593.64 for the period, we enter these two figures, divide, and find that the charge to one account is 0.768 per cent of our total labor cost.

When we enter the total equipment-rental cost for the period, \$624.75,

and multiply this figure by the same percentage, 0.768, the machine gives us an answer of \$4.798, which represents the amount we will charge this account for equipment. At each step, the 99's Simpla-tape shows every figure, so that there is an absolute check on accuracy as we proceed and no recalculating is necessary.

To work out the equipment-rental distribution problems accurately would normally require about two hours' time for an average of twenty accounts. The 99 does it in a half hour.

Various other uses

Monthly requests for payment as the work progresses can be readily figured in the same manner. Such a request is detailed, based upon a different percentage of completion for each portion of the work. The per-

(Continued on next page)

BURCH ROAD WIDENER

(PATENTS PENDING)

- One-man control.
- For 2 ft. to 4 ft. standard widening.
- 4-speed conveyor belt.
- Will empty its hopper as fast as you can fill it.
- Equipped with BURCH exclusive truck coupler and special BURCH adjustable truck hitch.
- Applicable to any standard dump truck.
- No blocking of highways—right-hand lane always open for traffic.

Write Dept. CE for literature.



The BURCH Road Widener is attachable to any truck. Built-in conveyor, which is driven by heavy industrial gas motor, will deliver material where required. It will handle sand, gravel, stone, or bituminous material. Self-propelled and steered by hydraulic equipment. A high-speed unit unexcelled in road construction.

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.

MANUFACTURERS OF EQUIPMENT
FOR CONSTRUCTION AND MAINTENANCE
OF ROADS AND STREETS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 563



... If you are trying to meet strict compaction specifications by adding more dead weight or making more passes with old fashioned equipment, your costs will keep mounting—but with modern TERRAPAC dynamic vibratory compaction you'll save hours of costly time on every job—do more work, more profitably!

VIBRATION—A KEY TO COMPACTION COSTS

Contractors using TERRAPAC vibratory rollers can usually put in two or three times the depth of fill that would be allowed with a static roller—then compact it faster, better and deeper in fewer passes... Dynamic compaction saves TIME!

TERRAPAC ELIMINATES USELESS DEAD WEIGHT

The TERRAPAC model CH30 weighs only 3½ tons yet will compact deeper, in fewer passes, than an ordinary 30 to 50 ton roller. Balance is so even that one man can lift either end... Vibration frequency can be regulated... Light weight permits easy handling on any type fill or soil plus rapid transport on any highway. Wide (58") roller... Diesel power.

TERRAPAC VIBRATORY ROLLERS



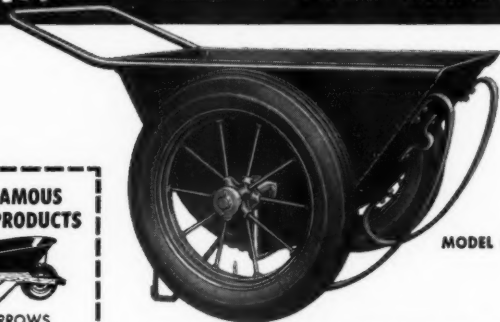
VIBRO-PLUS HONOLULU, HAWAII, STANHOPE, N. J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 564

CONCRETE CARTS

by **JACKSON**
TRADE MARK

Oldest and Largest
Wheelbarrow
Maker In America



MODEL 8-88

OTHER FAMOUS JACKSON PRODUCTS



WHEELBARROWS



WHEELS



GAS
SALAMANDERS



MIXING BOXES



MORTAR
PANS

Rugged Jackson concrete carts have perfect balance and rocker runners for controlled dumping. Won't roll back on operator. Equipped with drop axles. Steel or pneumatic tired wheels with roller bearings and zerkl fittings. Available in many models with 6, 8, or 10½ cu. ft. heaped capacity.

ASK YOUR CONTRACTOR EQUIPMENT DISTRIBUTOR

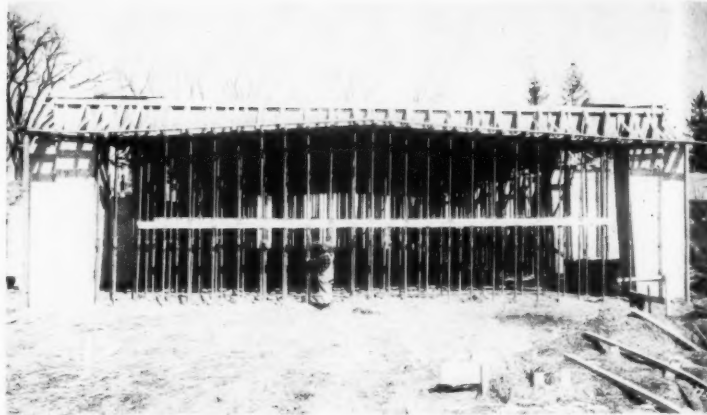
Jackson

Manufacturing Co. • Harrisburg, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 562

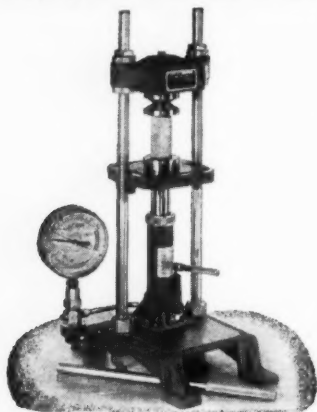


THREE TRUCKS DO THE WORK OF ELEVEN, and a 14-mile haul from a permanent batch plant is eliminated with this Noble-Mobile batching-plant-on-wheels used by Wamix, Inc., Dallas, Texas, concrete supplier. For details on this mobile plant circle No. 216 on card at page 18, or write to the Noble Co., 1860 Seventh St., Oakland, Calif.



ONE-MAN HANDLING, RAPID LEDGER SETTING, and the minimum bracing requirements of Safway all-steel adjustable shoring saved the S. M. Byrne Construction Co., Milwaukee, Wis., 20 per cent of the pour time on this reinforced-concrete church. For details on the shoring circle No. 222 on card at page 18, or write Safway Steel Products, Inc., 628 W. State St., Milwaukee 13, Wis.

Cut Road Building Costs with SOIL AND BASE MATERIAL TESTS... on the CARVER LABORATORY PRESS



Numerous soil tests necessary prior to road building or other construction can be quickly and easily accomplished on the portable, hand-operated, self-contained CARVER LABORATORY PRESS. Moisture content, compaction, shear and other soil or base material characteristics are readily determined with this on-the-spot equipment.

Samples are quickly pressed for soil tests or further analysis and testing with Carver Test Cylinders, available in two sizes—1½" and 2¼" diameter. Other Standard Accessories available include Carver Swivel Bearing Plates for comparative crushing tests of 2" x 2" cubes; 2" x 4" cylinders and like requirements.

Several state road departments have used this equipment successfully for years. A Florida State Road Dept. engineer reports "Six Carver Presses are used daily for the numerous soil tests—." They have recently purchased four additional presses. The Texas State Highway Dept. has purchased over 30 Carver Laboratory Presses for such use—perhaps this thoroughly standardized Press will answer your pressing problems.

- CRUSHING TESTS • BRIQUETTING
- BREAKING TESTS • SHEAR TESTS
- BENDING TESTS

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
7 CHATHAM ROAD, SUMMIT, N. J.

Send catalog, describing Carver Laboratory Press and Standard Accessories.

NAME

FIRM

ADDRESS

For more facts, use coupon, or circle No. 567

170

(Continued from preceding page)

centage may be carefully estimated, or, with operations such as concrete pouring, can be exactly calculated.

The total request may run to seven or eight pages. Further detailed breakdowns of sections of the work may be made in subcontractors' requests for payment, which are checked and forwarded, along with our request for supporting data, first to the architect for approval and then to the owner for payment.

A number of other uses for the 99 are found every day in our field offices. Special labor payoffs can be made on the spot when workers are discharged, and the entire payroll for out-of-town contracts can be figured on the calculator.

Extension of purchase orders is often performed in the field so that cost data will be constantly available, and in the office of a subsidiary, Machinery Processing, Inc., a 99 is used about four hours a week for complex figuring on the basis of size or weight



UMECO 5 3/4" SURVEY TRANSIT

Model 575 Only \$515.

PRECISE • RUGGED • RELIABLE

Fully Guaranteed

Complete line of transits, levels, compasses, planimeters. Folder on request.

UMECO OPTICAL DIVISION
465 California San Francisco, Calif.

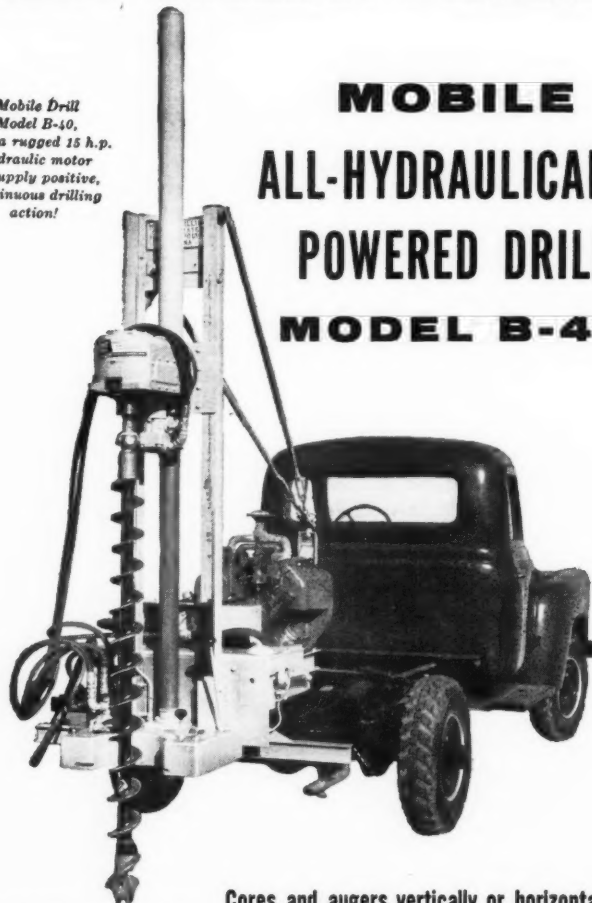
Exclusive Western Distributor:
A Lietz Co., 840 Post, San Francisco
1224 S. Hope, Los Angeles

For more facts, circle No. 568

New! Versatile! Portable!

Mobile Drill Model B-40, with a rugged 15 h.p. hydraulic motor to supply positive, continuous drilling action!

MOBILE ALL-HYDRAULICALLY POWERED DRILL MODEL B-40



A COMPLETE LINE OF MOBILE DRILLS INVESTIGATE!

MODEL B-27

● Light! Powerful! Field proven for exploratory work in unconsolidated formations. Mounts on Willys vehicles P.T.O. driven. America's most outstanding light, portable rig.

MODEL B-35

● A convertible drill for vertical-horizontal work, featuring a new safety hydraulic clutch. Willys mounted, operated by P.T.O.

MODEL B-36

● A tough, portable rig for heavier formations and P.T.O. operated. Mounts on any 4-wheel drive International or Dodge Power Wagon.

MODEL B-52

● Heavy-duty! Operated by Ford Industrial Power Plant. Built to withstand terrific torque of toughest formations. Adaptable to a really extensive list of uses.

Cores and augers vertically or horizontally. Brings economy to under-highway boring.

Light, powerful, low-cost drilling... yours, with the new Mobile Drill Model B-40. This one-man-operated rig easily mounts or dismounts on the front, rear, or side of all vehicles, including wheel or crawler tractors. Cores with air or water to 200', augers to 75' in minutes. The B-40 quickly converts to any degree in a 360° angle, cuts costs on underground water, gas, and power-line installations. Light enough for air transport to remote areas, powerful enough for a complete range of tough exploratory jobs. Never before has such a LOW COST drill with such amazing power and versatility been offered. Write, phone, or wire today for complete information!



MOBILE DRILLING, INC. • 950 NORTH PENNSYLVANIA STREET • INDIANAPOLIS 4, INDIANA

World's Largest Manufacturer of Light Vehicle Powered Drills

For more facts, use Reader-Reply Card opposite page 18 and circle No. 569

CONTRACTORS AND ENGINEERS



EQUIPMENT DOWNTIME AND LABOR COSTS are pared by Sugden-Sivier, Inc., Oak Park, Mich., contracting firm, with this Austin-Western hydraulic crane, here preparing to replace a truck body on the chassis. Operating cost: \$7 a day. For details on this crane circle No. 219 on card at page 18, or write Construction Equipment Division, Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill.



BOTTOM-DUMP AND END-DUMP UNITS couldn't discharge this sticky marine clay the Dutcher Construction Co., Queenstown, Md., ran into on a St. Lawrence Seaway lock project, but the Movall's positive ejection feature turned the trick. For details on the Movall circle No. 218 on card at page 18, or write to C & D Division, Yuba Mfg. Co., Folsom Blvd., Perkins, Calif.

of machinery lifted or stored.

In the main office, one unit is used regularly to handle our payroll work. Other machines are located where needed by our scattered field offices.

By replacing the combination of a conventional adding machine and a rotary-type calculator with the Remington Rand 99 Printing Calculator, we have benefited in many ways. Its portability, light weight, and compactness lend it to profitable use in the field, and the Simpla-tape, which can be stopped and restarted without backtracking, gives immediate, correct results. In addition to its more intricate work, the machine also does innumerable simple additions and subtractions, and in the proration of rental-equipment costs, carries the figure to five decimal places. This means that the most we have to compensate for is one or two cents in our distribution charges.

THE END

A Calendar of Coming Conventions appears on page 56 of this issue.

Automatic "SLOPE METER"

AIDS OPERATORS • SPEEDS WORK



Easy to Use — Convenient
A Real Time Saver

SLOPE METERS can be used to advantage on all sizes of tractors, bulldozers, scrapers and graders.

Do you want to . . .

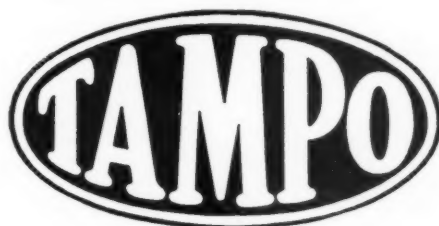
- Make accurate slopes in less time
- Reduce machine time required to make perfect highway crowns
- Speed up night work
- Eliminate costly hand checking
- Construct and check variable slopes while your machines are in motion
- Avoid wavy slopes—Slope Meters give a continuous check between stakes
- Help your operators do more and better work

Then order a SLOPE-METER for each one of your machines today from your Equipment Distributor or

THE SLOPE METER CO.
EXCELSIOR, MINNESOTA

For more facts, circle No. 570

JUNE, 1956



SELF
PROPELLED SP-9

APPROVED



from

Coast to Coast
ON ALL
TYPES OF JOBS

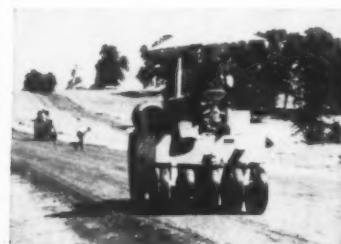
Job to Job and On the Job Under its own Power SP-9



ARIZONA. Sealing Rubberized Asphaltic concrete on jet airstrip — Williams AFB, Arizona.



GEORGIA. Rolling asphalt Taxiway, Municipal Air Terminal — Atlanta, Georgia.



CALIFORNIA. Rolling cement treated base course.



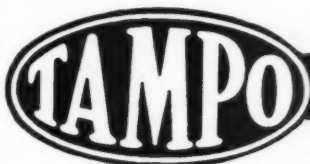
MINNESOTA. Surface compaction of asphaltic concrete. Minneapolis, Minnesota.



OHIO. Compacting Asphaltic concrete. Columbus, Ohio.



CANADA. Base course compaction refinery project. Winnipeg, Manitoba, Canada.



MANUFACTURING COMPANY

P.O. Box 2340 • 1146 W. Laurel St. • San Antonio, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 571



"BECAUSE OF THE FAST, EASY, AND SAFE LOADING features of Martin folding-gooseneck trailers, we can use a track-type crane and make it as mobile as a truck crane," reports the Gunther Construction Co., Galesburg, Ill. For details on the Martin trailers circle No. 215 on card at page 18, or write to the Martin Machine Co., Kewanee, Ill.



EIGHT-INCH CONCRETE LACED WITH REINFORCING STEEL rips out easily when attacked by Pangia Construction Co.'s International-Drott TD-14 Skid-Shovel. The Atco, N. J., contractor says the Skid-Shovel rips out slabs a ¾-yard shovel can't budge. For details on the Skid-Shovel circle No. 217 on card at page 18, or write to the Drott Mfg. Co., 3841 W. Wisconsin Ave., Milwaukee 8, Wis.

To do this CUTTING JOB BETTER-



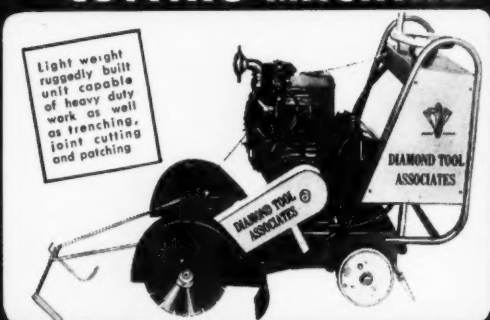
Whether cutting concrete or asphalt, you keep costs at a minimum and do a really effective job with "DTA" equipment.

You need this CUTTING BLADE-



"DTA" segmented blade was developed especially for tough cutting jobs to give consistently better performance - faster, smoother, reduce costs.

And this CUTTING MACHINE-



Light weight ruggedly built unit capable of heavy duty work as well as trenching, joint cutting and patching.

and of course DTA*

6

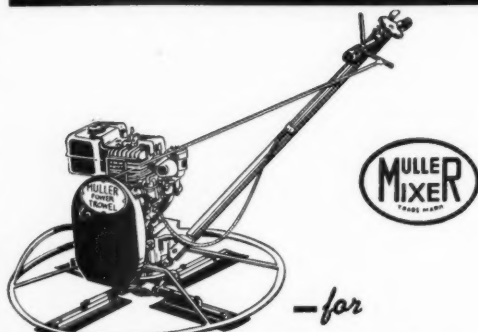
- BIG REASONS WHY "DTA" IS YOUR BEST BUY**
1. Outstanding research and development.
 2. Precise control of manufacturing process.
 3. Highest quality diamond BOART.
 4. The best in metal bondings.
 5. Top quality steel centers.
 6. Complete sales and field service by experienced personnel selected for their knowledge of your cutting problems.

*DIAMOND TOOL ASSOCIATES

P.O. Box 85 • 940 E. El Segundo Blvd. • Hawthorne, Calif.

For more facts, use circle No. 572

the new MULLER POWER TROWELS



—for easier handling and smoother jobs

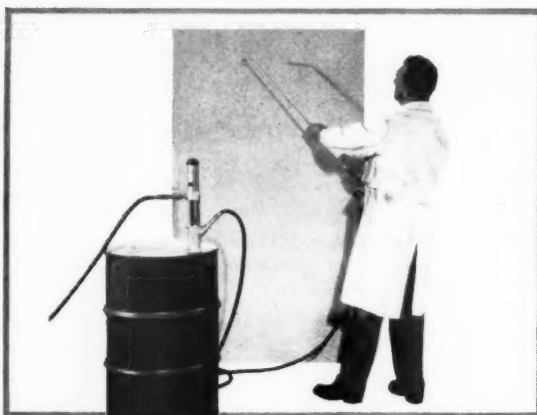
These new 4-Blade Power Trowels finish concrete smoother than conventional 3-blade types. They can get on the concrete sooner, and are much less tiring to the operator because vibration and lateral pull are greatly reduced.

Blade adjustment, engine throttle and power throw-out are conveniently located at the top of the handle. Timken Bearings maintain accurate alignment in all four sizes—24", 29", 34" and 44". Separate Floating and Finishing Blades are standard equipment.

Send for folder, prices, name of nearest dealer.

MULLER MACHINERY COMPANY, Inc.
Metuchen 15, N.J. Cable Address MULMIX

For more facts, use circle No. 573



NEW POWER SPRAYER FOR FORM OILS AND WATER REPELLENTS

Pumps direct-from-drums. A hundred times faster than a brush...sprays heavy or fine...coats hard to get at areas in a jiffy.

Graco's air-operated Fast-Flo Pump slips into oil drum in seconds. Weighs only 13½ lbs. and pumps up to 23 GPM. Write for Fast-Flo bulletin—giving complete description.

GRACO

GRAY COMPANY, INC.
610 Graco Square
Minneapolis 13, Minnesota

Fast-Flo

"DIRECT-FROM-DRUM" PUMP

FACTORY BRANCHES
New York (Long Island City)
Philadelphia • Detroit • Chicago
Atlanta • San Francisco

For more facts, use circle No. 574

HRB releases report on trends in travel

A series of five papers presented at the thirty-fourth annual meeting of the Highway Research Board in January of 1955, has been compiled into a booklet, "Factors Influencing Travel Patterns". Urban, expressway, and holiday traffic are discussed, summaries are given, and conclusions are drawn. Charts, graphs, and diagrams illustrate the text.

Priced at \$1.80, the book is available from the Highway Research Correlation Service, Highway Research Board, 2101 Constitution Ave., Washington, D. C.

Soil, material tests

■ A complete line of Soiltest physical testing apparatus for soils and concrete, and for bituminous materials is featured in a 104-page catalog from the company. Triaxial apparatus, pore pressure, sieves, specific gravity, laboratory sets, drill rigs, piezometer sets, and books, manuals, and data sheets are treated. Described general testing equipment includes scales and balances, calibrated weights, dial indicators, ovens and heating units, humidifiers, mixers, compressors and pumps, and instruments and tools. Also presented are concrete and bituminous-testing apparatus, mobile laboratories, and foundry test apparatus.

To obtain Catalog 55 write to Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 21.

Steel barricades

■ A folder from Traffic Equipment Corp. features all-steel barricades for street and highway construction. The Sentry barricades are composed of panels of 16-gage electro-galvanized and bonderized steel with a baked-enamel finish. A diagram points out the hot-rolled steel sections and the 13-inch steel posts that carry all panels. Specifications and job photos are included.

To obtain this folder write to Traffic Equipment Corp., 2461 S. Dahlia Lane, Denver, Colo., or use the Request Card at page 18. Circle No. 30.



"A PERFECT MOVER OF BULK BUILDING MATERIALS OR AGGREGATES" is the way B & B Truckers, Inc., Hurst, Texas, describes the Hobbs Schonrock cable-dump trailer. This supplier uses 20 of these units to haul 2,700 cubic yards of sand and gravel a day. For details on Hobbs Schonrock trailers circle No. 225 on card at page 18, or write **Hobbs Trailers**, 609-633 N. Main, Fort Worth 1, Texas.



LOADING ROCK EXCAVATION INTO TRUCKS at the rate of 150 to 250 cubic yards per hour is the kind of performance Broward Engineering Co., Fort Lauderdale, Fla., is getting from this Hough HO Payloader on a 1,800-acre housing development. For details on the HO Payloader circle No. 220 on card at page 18, or write to the **Frank G. Hough Co.**, 822 Seventh Ave., Libertyville, Ill.

EFFICIENCY AND ECONOMY

LENKER AUTOMATIC LEVEL ROD

EVERY
ROD READING
AN
ELEVATION
NO
COMPUTATIONS

AWARDED
MEDAL OF MERIT
FOR UTILITY
~ BY ~
FRANKLIN
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OF
PHILADELPHIA

Write for Circular
LENKER MFG. CO.
599 CHESTNUT ST.
SUNBURY, PA.

MIT offers summer course on dynamic loading design

A special summer program, lasting for two weeks and offering a short course on structural design for dynamic loads, will be given by Massachusetts Institute of Technology. The program is planned for both practicing structural engineers who have had experience in design for dynamic loadings and for those who have been primarily engaged in designing for essentially static loadings.

The course will be given between August 6 and 17th.

Application forms may be obtained from the Summer Session Office, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

Caterpillar plans branch of parts department

A new branch of its parts department has been opened in Denver, Colo., by the Caterpillar Tractor Co. of Peoria. The office will supply Caterpillar dealers in the Rocky Mountain and Pacific Coast areas with their normal parts inventory and will also handle emergency orders.

The new branch, to be located on a 40-acre site in northeastern Denver, is scheduled to open in mid-1957. Paul H. Bringer will manage the facility.

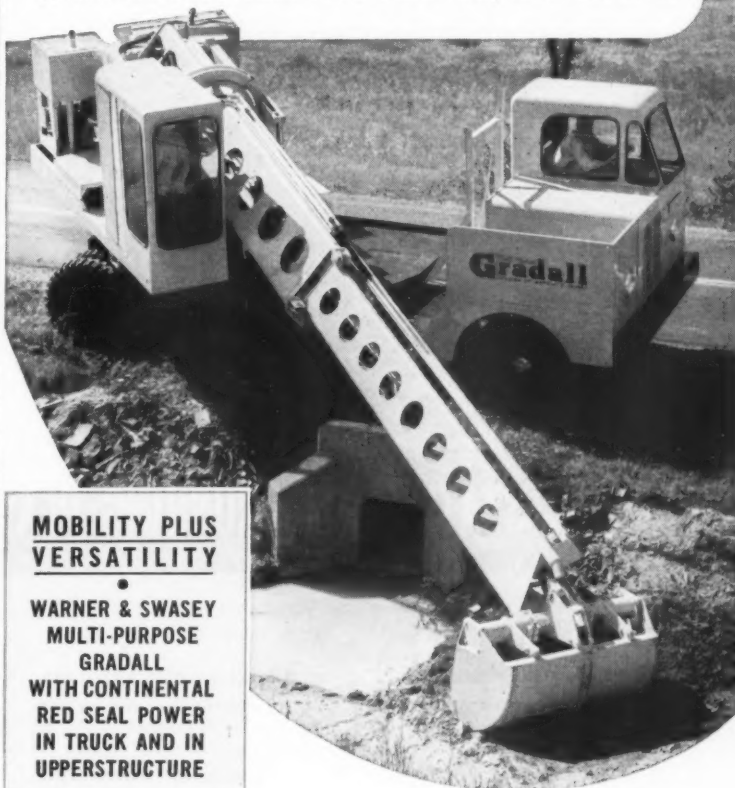
Another new plant will be built in Aurora, Ill., for the manufacture of D2 and D4 crawler tractors and the two corresponding sizes of Traxcator tractor shovels. At the same time, the Decatur and Joliet, Ill., plants will be enlarged.

Trench cutter

■ The Parsons Model 150 Trenchliner, with cutting widths from 16 to 26 inches, is featured in a catalog from the firm. A diagrammatic picture points out the bucket cleaner, controlled discharge, crumbler, hydraulic wheel hoist, friction-type clutch, operator's side position, gears, and crawlers. The catalog claims the unit has a 6.3 ground pressure.

To obtain this catalog write to Parsons Co., P. O. Box 431, Newton, Iowa, or use the Request Card at page 18. Circle No. 176.

Changing the Face of the World with CONTINENTAL RED SEAL POWER



MOBILITY PLUS VERSATILITY

WARNER & SWASEY
MULTI-PURPOSE
GRADALL
WITH CONTINENTAL
RED SEAL POWER
IN TRUCK AND IN
UPPERSTRUCTURE

Wherever you go these days, you see men at work re-shaping the landscape with the aid of modern construction machines. And no matter what the specific job—clearing land, ditching for irrigation, grading for railroads and highways, laying pavement or wrecking buildings—you'll note a pronounced swing, of late, to equipment with Continental power. The adoption of dependable Red Seals—gasoline or Cushioned Power Diesel—by more and more builders of construction and industrial equipment, reflects a spreading recognition, on the part of machine users, of this basic fact: There's a vast difference, in performance, dependability, economy and upkeep cost, between the ordinary engine and the Continental Red Seal that's engineered and built for the job.

SERVICE FACILITIES AND RED SEAL PARTS AVAILABLE EVERYWHERE

Continental Motors Corporation
MUSKEGON • MICHIGAN

6 EAST 45TH ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 56, CALIF.
5216 CEDAR SPRINGS ROAD, DALLAS 9 TEXAS • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 576





RENT...THE ORIGINAL

Neo-Flasher

BARRICADE

ALL METAL FULLY SCOTCHLITED

FOR NO MORE THAN THE COST OF
OPERATING ONE KEROSENE TORCH!

OUR SERVICE IS DEPENDABLE!

- NO STORAGE PROBLEMS •
- NO BARRICADES TO BUILD • NO CAPITAL INVESTMENT
- NO MESSY KEROSENE • NO WEEK-END PREMIUM LABOR

FRANCHISES AVAILABLE . . . Check the possibilities

NEO-FLASHER MANUFACTURING COMPANY

3310 Vahalla Drive, Burbank, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 577



Efficiency at the dealer level

**Smart business practices pay off
in handsome sales volume
for this Boston distributor**

Used equipment? "Don't go overboard. In the long run, it's better to keep it at an absolute minimum."

Cost control? "A dealership is like any other business; you've got to keep a close check on costs if you want to operate efficiently."

Salesmen? "Get good ones, back them all the way, and let them do the selling."

Demonstrations? "One of the best selling aids. If you've got lines that are easy to demonstrate, get them out on the job and show them."

Branch management? "Get a good man, and then leave him alone."

These comments on some of the more important (and frequently troublesome) phases of dealership operation are the words—and the philosophy—of a Boston distributor with more than 40 years' experience in the construction-equipment field. And they summarize a technique by which the Clark-Wilcox Co. achieves an annual sales volume of well over three million dollars.

The man with the advice is F. P. Wilcox, co-founder and president of a distributing firm which serves contractors, highway departments, and other users of construction equipment in eastern Massachusetts, New Hampshire, and the state of Rhode Island. Assisted by 30 employees, Wilcox and Harvey A. Fitts, his vice president and general manager, operate the Boston office and a branch, opened three years ago, at Providence, R. I.

One of Clark-Wilcox's biggest lines is Michigan tractor-shovels, and it does a neat one-million-dollar business annually in these popular rigs. Other important lines handled by the company include Bucyrus-Erie cranes, shovels, and other excavating machinery; Euclid scrapers, trucks, and—when they are available for general distribution—tractors; and Blaw-Knox construction equipment.

With a thriving distributorship to show for his more than 40 years' experience, Wilcox should have some definite ideas on how to introduce efficiency and economy into everyday dealer operations. Some of these are included in the quotes at the beginning of this article; others are implied in the way Clark-Wilcox goes about chalking up that annual three-million-plus sales figure.

Tight on trade-ins

Take the question of trade-ins, for example. Every dealer realizes they



"We made the right decision when we bought Lippmann"

"The way your crushing plant is operating for us convinces us more than ever that we made the right decision two years ago when we bought Lippmann crushing, screening and conveying equipment to replace the brands we had been using. The whole plant from feeder through to the hoppers has done a really good, consistent job of producing more material at lower costs. No doubt about it, it's been a big help job-wise, cost-wise and profit-wise."

(Signed) JOHN L. KELLEY, Owner
Roscoe, Illinois

LIPPMANN STATIONARY CRUSHING PLANTS

30 x 36 Rock-Ram Stationary Crushing Plant in Ohio includes Lippmann feeder, conveyors, screens, pulverizer and bins.

There are good reasons why Lippmann crushing plants give Mr. Kelley, and so many others a feeling of satisfaction for having switched to Lippmann.

First of all, they now enjoy the effectiveness of Grizzly-King and Rock-Ram crushing, Screen-All screening and Ever-Seal conveying — top machines all. Then, too, engineering "know how" that for 33 years has kept Lippmann crushing equipment in the foreground, is applied to the over-all layout and design of these plants. Add to this Lippmann's practice of backing its products to the limit and it's no wonder the switch is to Lippmann.

You can easily learn more about the many advantages of Lippmann design by contacting your Lippmann distributor or the factory direct. Lippmann Engineering Works, 4637 West Mitchell Street, Milwaukee 14, Wisconsin.

1900-56-5



24 x 36 Lippmann Crushing Plant mounting a Grizzly-King jaw crusher, feeder, vibrating screens, washers and conveyors. Location — Wisconsin.



Complete Lippmann crushing, screening, washing plant (conveyors, screens, crusher, hoppers, scrubber and washer) in an Ohio pit.



LIPPMANN

SINCE 1923

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 578



F. P. Wilcox, co-founder and president of the Clark-Wilcox Co.

Winter or summer, the Clark-Wilcox Co. has a supply of Michigan tractor-shovels at its Boston plant. From left: the 125A, 175A and 180 Turbo-Dozer.



can be a headache—especially when the used equipment begins to pile up in his yard. Clark-Wilcox doesn't let this happen, however; the inventory of second-hand machinery never goes above the \$50,000 mark. "We don't believe in going overboard on trade-ins just to make a sale," Wilcox declares. "The payoff on that kind of operation comes when you find yourself with \$300,000 or more tied up in old iron."

Proof that the company practices what it preaches is this inventory of used equipment, on hand the day this magazine visited the Boston plant: three tractor-shovels (one already sold), two shovels, and three pieces of smaller equipment.

Like most enterprising firms in whatever field, Clark-Wilcox believes in and practices close cost control. A staff of three under the supervision of C. E. DesRoches, office manager, handles the accounting end of the business, and figures on inventories, sales, expenses, and other phases of daily operation are always up to date for management checking and comparison.

For its two plants, Clark-Wilcox has six salesmen. Unlike many other distributors, neither Wilcox nor Fitts spends much time in the field—although they are both available to anyone who calls at the office. But when it comes to sales, they feel that the salesmen should be on their own.

"We want the customer to have complete faith in, and rely on, our salesmen. "If the 'head man' keeps dropping in, the customer is likely to bypass the salesman and go right to the top. We have pride in the ability of our men, and we want the customer to take full advantage of that ability."

One of the best sales aids, the company feels, is field demonstrations of machinery. This is particularly true in the case of the Michigan tractor-shovels, according to Wilcox. Approximately 50 per cent of the company's sales of these machines are from demonstrations suggested by salesmen.

In addition to the six salesmen, the Clark-Wilcox personnel includes three parts men in Boston and one at the Providence branch. A large parts inventory, numbering 5,200 different items, is carried by the firm.

Prompt, dependable service is stressed by the company. Of a total

(Continued on next page)



Versatile D Tournapulls save time for Illinois contractor

Handle production dirt and finish work

On U.S. 66 near Pontiac, Illinois, 650,000 cu. yds. of clay and topsoil were moved and spread to widen 25 miles of this highway.

On the job, the Standard Paving Co., of Chicago, encountered production difficulties when 2 of their 4 scrapers broke down. To keep production dirtmoving on schedule, one 28 mph D Tournapull was moved from shouldering work to production hauling. A second "D" remained on fine grade and other one-man-crew clean-up assignments.

8400' cycle every 8 minutes

Working with a pusher from a borrow pit, the 138 hp "D" loaded 5½ pay yards of tough-to-handle clay in about 30 seconds. "D's" ability to partially self-load saved time and work for pusher on loading cycle. Haul, spread, and return took about 7 minutes. 8400' cycle was completed in 7½ minutes. Cycle time for other

scraper units averaged about 9.5 minutes. Despite the fact that "D" was working with bigger rubber-tired dirtmovers, it matched, and often bettered the speeds of bigger units on haul and return trips.

Second "D" on fine grading

The second D Tournapull was being used with a motor-grader to fine-grade before paving courses were put down. It self-loaded excessive dirt windrowed by grader. Unit averaged 1¾ minutes on 350' cycle. Operator Henry Carbine said, "The 'D' is the best machine for fine-grading."

Tops for any job

You'll find, as did this contractor, that the versatile D Tournapull is a mighty handy tool to have in your fleet. It is ideal for hauling, grading, building shoulders, shaping back-slopes, digging drainage ditches, spreading gravel, connecting access roads, backfilling around culverts, leveling land, stripping overburden, and doing dozens of other scattered small clean-up jobs that turn up. It

is a machine that can work and earn every day of the year.

Speeds job-to-job

D Tournapull runs at 28 mph from job-to-job. Big 18:00 x 25 low-pressure tires allow unit to travel anywhere... over pavement, blacktop, curbs, railroad tracks and bridges. Extreme mobility of "D" saves time by allowing it to take the shortest route to job. To find out what the 7-yd. D Tournapull can do for you on your next dirtmoving job, see your LeTourneau-Westinghouse Distributor. He'll be glad to show you owner-verified production figures



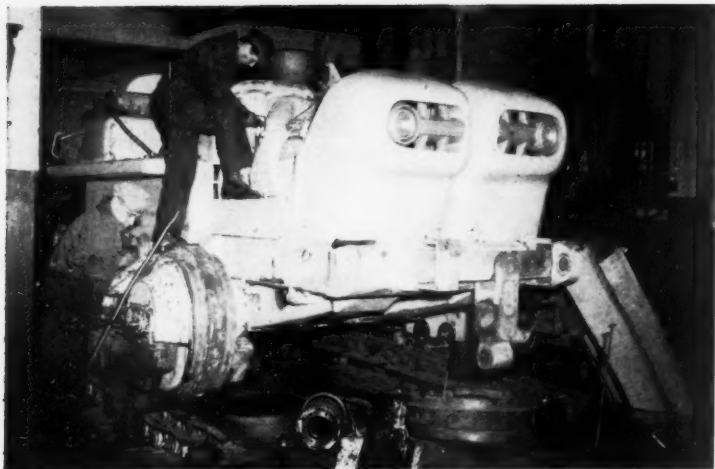
"D" self-loads, hauls and spreads windrowed material on 350' cycle in about 1¾ minutes. Tournapull—Trademark Reg. U.S. Pat. Off. DP-875-H-b



LeTourneau-WESTINGHOUSE Company
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 579



A Euclid TC-12 tractor gets an overhauling in the Clark-Wilcox maintenance shop at Boston. The company will distribute the big twin-power tractor after it is put into production.

Clark-Wilcox Co. believes in letting its salesmen do the selling in the field, but both Mr. Wilcox (shown here at right) and his general manager, Harvey A. Fitts, are always available to callers in the office.



Foundation Offers Worldwide, Wellpoint Service

Anywhere on the face of the earth you are likely to find FOUNDATION Wellpoint Systems performing economically and dependably for the world's leading contractors. Recent jobs have been successfully handled in Thailand, England, Bermuda, Wales, Australia as well as in all sections of the United States.

Each FOUNDATION Wellpoint System is adapted to the exact requirements of the job. Each is engineered and installed by practical construction men with nearly 30 years of experience in all phases of dewatering.

As an added assistance to contractors, FOUNDATION offers a money-saving "pre-bid service." Write today for literature and complete information.

NOW for better service to contractors in the Southern section of the United States, FOUNDATION Wellpoint Corp. has opened a facility in Fort Pierce, Florida. This latest unit in FOUNDATION'S World-Wide network is competently staffed with dewatering experts and carries a full line of dewatering equipment. To save time you can now send inquiries direct to FOUNDATION Wellpoint Corp., Fort Pierce, Florida.

FOUNDATION WELLPOINT CORP.

Long Island City 1, N. Y. • Ft. Pierce, Florida • Chicago, Illinois

Overseas Associates

Millars' Machinery Company, Limited — London, England

Branches: South Africa, Australia, India, Egypt, Spain, France, Malaya

For more facts, use Reader-Reply Card opposite page 18 and circle No. 580

(Continued from preceding page)
of 10 mechanics, nine are in the Boston plant—for most of the repair work is done here in a large, well-equipped shop.

New equipment inventory

Although the field is Clark-Wilcox's best showroom, the company makes a point of having equipment on hand at all times. This means a new equipment inventory of nearly a half million dollars in value, but "it's not very easy to sell equipment that you can't show." The company always has about a dozen Michigan rigs of various sizes on hand.

Direct mail advertising, involving the descriptive literature that manufacturers make available for this purpose, is another important phase of the Boston dealer's operations. Its mailing list of some 1,800 includes contractors, highway department purchasing agents, aggregate and cement producers, and some industrial concerns who use material-handling rigs like the Michigan tractor-shovels. With Euclid's big new TC-12 now in production, Clark-Wilcox's me-

BARTLETT Tree Paint



Guard against fungi and decay by dressing tree wounds with Bartlett Black Asphalt Liquid Tree Paint. Easily applied with ordinary paint brush. Will not freeze. 5-gal. drum \$15.00; 1 gal. \$5.50. Prepaid in U.S.A.

Write now for free illustrated catalog of tree trimming tools and tree surgery supplies.

BARTLETT MFG. CO.

3035 East Grand Blvd.
Detroit 2, Mich.

For more facts, circle No. 581
CONTRACTORS AND ENGINEERS

chanics won't be unprepared once the big tractor starts coming in for service. The company is now overhauling its second such rig, and an unstreamlined, pilot version of the model is in the equipment yard awaiting repair. These were machines placed in the field directly by the manufacturer, and Clark-Wilcox has been working closely with a factory representative in overhauling them.

Experience with TC-12

Clark-Wilcox salesmen and parts men, too, are prepared to handle the new tractor line; for 17 years the firm was the top United States distributor for a major crawler tractor manufacturer.

Experience is a commodity which Clark-Wilcox offers to its customers along with the equipment lines it carries. There is comparatively little turnover in this company, the president himself being there about 33 years; the general manager, about 27 years; the branch manager, nearly 12 years; and the parts men and salesmen, an average of a dozen years. Each has thorough knowledge of the equipment, the territory, and the customers' needs.

Wilcox himself started out in 1910 working for Ransome in New Jersey, and the first dual-drum paver was his idea. He took over a distributorship in Kansas City, Mo., at the age of 21. After Army service in the first world war he sold equipment in New York and Connecticut until 1923, when he and W. I. Clark formed a dealership in New Haven. In 1925 they opened the present Boston plant, and shortly afterwards Clark withdrew to form his own company in Connecticut. Mr. Wilcox operated as a one-man firm until 1929, when Harvey Pitts joined him as a salesman.

Today, Clark-Wilcox handles 16 major lines and other smaller accounts. The Boston plant has 15,000 square feet of space; the Providence branch 6,000 square feet. Expansion is just around the corner, though, for a good distributor firm—again like any other business—never stands still.

THE END

Three-axle roller

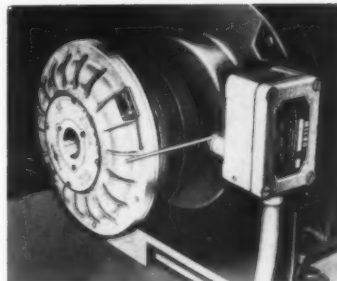
■ Buffalo-Springfield's Model KX-25E 3-axle tandem roller is described in a bulletin from the company. The outstanding feature of the 13 to 20-ton roller is the walking-beam compaction control, which is claimed to take maximum advantage of the weight-transfer principle to compact up to 60 per cent greater tonnage per day in superhighway construction. Power roll brakes, synchronized hydraulic steering, four-speed transmission, and bevel-gear final drive are some of the topics discussed and illustrated. Also included in the bulletin are photos of standard and optional equipment and data on dimensions, specifications, ballasted and unballasted weights, and compression.

To obtain Bulletin S-71 12-55 write to Buffalo-Springfield Roller Co., 1210 Kenton St., Springfield, Ohio, or use Request Card at page 18. Circle No. 7.

Thermal cutout guards unit from overheating

■ Protection against overheating of Flexidyne, the dry fluid drive, is provided by a thermal cutout just announced by the Dodge Mfg. Co., manufacturers of Flexidyne. If an overload causes prolonged slipping and consequent heating of the Flexidyne, the thermal cutout trips a switch that cuts off power and, if desired, gives an alarm.

The Dodge thermal cutout is recommended especially for unattended



installations. The device is mounted on the side of the Flexidyne, and it contains a trigger spring, held down

by an alloy thermal pin. Before the Flexidyne can heat up sufficiently to cause damage, the thermal pin melts, allowing the trigger to spring out so that it will push the non-striking sparker of the special switch to the "off" position.

In resetting the unit, one screw is removed, the trigger is pushed back, a new thermal pin is inserted, and the screw is replaced.

For further information write to the Dodge Mfg. Co., Mishawaka, Ind., or use the Request Card at page 18. Circle No. 91.



Four-wheel drive, and tires 2' wide, give Tournatractor ample traction to make full use of its 208 hp.



Root-Rakes

Here is what high speed on rubber tires can do for you

Tournatractor, with 17 mph forward speed and 8 mph reverse speed, can do many tractor jobs twice as fast as a crawler-tractor.

Drives anywhere

Because of its big low-pressure tires, Tournatractor drives anywhere under its own power. Job-to-job moves can be made across pavement, over curbs, sidewalks, and railroad tracks. On long moves it saves time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Reduces maintenance

Tournatractor greatly reduces maintenance and service costs by eliminating some 500 wearing parts that grind through dirt in a crawler-track assembly. Eliminated also is the friction caused by grit-grinding in the track assembly which reduces rated horsepower.

Easy to operate

With simple, easy-to-handle, power controls, and comfortable, adjustable, foam-rubber seat, operator on

Tournatractor works comfortably, with less fatigue, maneuvers faster, gets more work done, in less time, with less effort.

High-speed performance

Constant-mesh transmission eliminates delays in changing gears... saves vital momentum... gives any gear-ratio instantly. As a pusher or dozer, Tournatractor high-speed reverse (up to 8 mph) is a very important time saver.

Versatility helps get more work done

Wide range of attachments increases Tournatractor range of applications, extend length of work season. Since Tournatractor is a "traveling man", these optional attachments are especially important in finding profitable jobs in a wide range of big or small industries and in any climate or area selected.

a. Equipped with Bulldozer or Angledozer blade, Tournatractor push-loads scrapers, moves short-haul dirt, cleans up at shovel, loads and spreads on dump, digs drainage ditches, maintains haul roads, clears land, terraces, digs

stock piles, grades roads. Does all these jobs fast.

b. Root-Rake makes 208 hp Tournatractor a powerful tool for clearing brush, grubbing roots, raking out boulders, etc. The 11'4" wide x 4'6" high rake has 10 teeth of 4" high-grade steel, to resist shock, do heavy work.

c. Tree-pusher attached to Tournatractor, reaches high on tree with 32' forked boom, provides extra leverage to push trees down fast. Boom angle creates down-pressure on tires, increases traction, helps remove more trees in less time.

d. Tournatractor with drawbar attachments does wide variety of chores—keeps working at 100% availability. Pulls scrapers, sheepfoot rollers, rooters, and other drawn equipment.

Ask for owner-verified job reports on work similar to yours.



Tree-pusher

Tournatractor, Angledozer, Root-Rake—Trademark Reg. U.S. Pat. Off. T-954-G-bw



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 582

Case history

Mobile radio "no luxury" on land-clearing job

R. G. LeTourneau, Inc., Longview, Texas manufacturer of land-clearing equipment, undertook its first job as a contractor recently—and discovered before long that two-way radio was an absolute necessity on the project.

LeTourneau's contract covers land-clearing and railroad-relocation work on a 300-square-mile area in the Texarkana Basin. The work is being done in connection with the development of the Texarkana Dam and Reservoir.

The contractor first tried operating without mobile radio, but the experiment was costly. A \$20,000 bull-

dozer was destroyed by fire, and the company feels fast communications could have brought help in time to save the machine. Also, supervisors were spending expensive hours driving over the job to gather information and deliver verbal instructions.

Before long, the contractor decided two-way radio was imperative if efficient operation was to be achieved. The Motorola system installed includes a 60-watt base station, two 30-watt portable bases for the movable maintenance camps, and mobile sets in the superintendent's car and the pickup trucks of the supervisors, parts chaser, and mechanics.

Countless savings have resulted from installment of this system. Downtime is shaved, and fruitless

Office manager Howard Smith communicates with roving supervisors and mechanics on R. G. LeTourneau, Inc., land-clearing project from the Motorola 60-watt base station at Mand, Texas.



parts-chasing eliminated, because the company can pinpoint the location of needed parts before sending a truck after them. Fire-fighting is coordinated, and prompt radio alarms

have saved three rigs so far. Closer cooperation with the subcontractor is possible.

LeTourneau feels the Motorola system has paid for itself many times over on the job. The units have proved durable, and a minimum of breakdown is reported.

For more information on the Motorola two-way radio system write to Motorola Communications & Electronics Division, 4545 W. Augusta Blvd., Chicago, Ill., or use the Request Card at page 18. Circle No. 272.

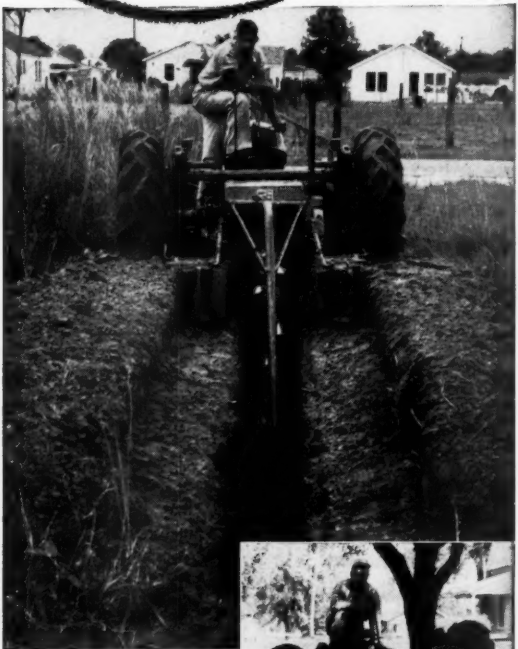
Heat-resistant asphalt

"Heat-Resistant Properties of Additives in Asphaltic Concrete", a paper presented at the 1956 regional meeting of the Western Petroleum Refiners Association, is available from the Carlisle Chemical Works, Inc. Reports on coating and stripping tests demonstrate that an additive will remain stable and function when heated in asphalt. Immersion-compression tests are used to measure the strength of briquets, and the resistance of an additive to film stripping and heat. Test charts point out that the effect of a non-stable additive is almost completely lost after the additive has been treated for 24 hours.

To obtain the paper write to the Carlisle Chemical Works, Inc., West St., Reading, Ohio, or use the Request Card at page 18. Circle No. 126.

ARPS TRENCH HOG

VERSATILE
ACCURATE
FAST
LOW COST



Ideal trencher for scores of jobs:

FOUNDATIONS
SERVICE LINES
DRAINAGE
IRRIGATION

Here's the handiest machine you ever owned—a fast, low priced, mobile tractor-mounted trencher for utility lines, foundations, sewer systems, septic tanks, etc. You'll find this ladder-type trencher working all the time. Cuts 6" to 20" wide trench down to a depth of 7'. Average digging speed 350' to 400' per hour—digs up to 800' per hour. Cuts through all soils the year 'round. Special chisel type cutters for rocky or frozen ground. Independent control of each drive wheel assures exact and easy regulation for either straight or curved trenches. Mounts on Ford or Ferguson tractor—easily driven from job to job—one man operated. Bulldozer blade available for backfilling. Write for all the facts today.

ARPS CORPORATION

DEPT. CDE

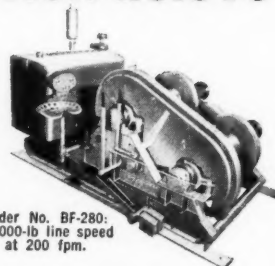
NEW HOLSTEIN, WIS.

PRODUCTS FOR BETTER FARMS. BETTER INDUSTRIES SINCE 1920

For more facts, circle No. 583

Electric, Gas or Steam Drive BAND FRICTION HOISTS

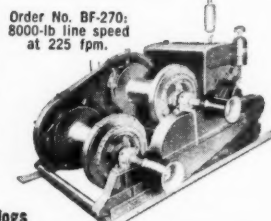
- Reversible for wear
- Non-burn lining
- "Face forward" friction and break levers
- Anti-friction bearings



Order No. BF-280:
10,000-lb line speed
at 200 fpm.

LIGHT... COMPACT... RUGGED!

Meet your hoisting needs precisely at lowest possible cost. Take advantage of our long experience in modifying and re-combining standard parts to meet individual hoisting requirements.



Order No. BF-270:
8000-lb line speed
at 225 fpm.

Write for Bulletins and Catalogs

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works—SUPERIOR, WISCONSIN
New York Office—7 Dey St., New York 7, N. Y.

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Need HOSE in a HURRY?

Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—whenever you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—when and where you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

ATLANTA 5, Ga.
477 Eighth St., N.E.

BALTIMORE 18, Md.
15 East 21st St.

BOSTON (Alls. 34), Mass.
12 Franklin St.

CHICAGO 10, Ill.
10 West Hubbard St.

CINCINNATI 2, Ohio
49 Central Ave.

CLEVELAND 15, Ohio
2731 Prospect Ave.

DETROIT 27, Mich.
13801 Schoolcraft Ave.

INDIANAPOLIS 4, Ind.
309 North Capitol Ave.

MEMPHIS 3, Tenn.
268 Madison Ave.

NEW YORK 7, N. Y.
81 Murray St.

PHILADELPHIA 6, Pa.
311 North Randolph St.

ST. LOUIS 8, Mo.
4018 Olive St.

SYRACUSE 3, N. Y.
739 Montgomery St.



Continental Road Hose—a high pressure water hose for rough use in road work. Top grade rubber tube is reinforced with frictioned duck wrapping thoroughly bonded to tube and cover. Red Rubber cover resists abrasion, gouging—protects carcass. Sizes 1 1/4" thru 4". Ask for catalog of HOSE and PROTECTIVE CLOTHING.

HOSE by CONTINENTAL

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

For more facts, use Reader Reply card opposite page 18 and circle No. 622

CONTRACTORS AND ENGINEERS

New clamshell bucket features power closing

■ To speed shaft mucking and excavating, Blaw-Knox Co. has introduced a new-type clamshell bucket which closes pneumatically and uses a single drum hoist. Both the $\frac{3}{8}$ and $\frac{5}{8}$ -cubic-yard sizes are designed to accommodate either the Ingersoll-Rand or the Gardner-Denver air hoist.

During deep excavation in a shaft, danger of delay in signals from workmen to crane operators presents a constant hazard. With the new Blaw-Knox bucket, workmen control its operation through open and close chains. The air hoist is so designed that when the chain is released the jaws of the bucket hold their position.

The upper structure has been so designed that the air hoist is directly on the vertical center line. This gives the bucket symmetry and balance. The cable lead from the face of the drum on the air hoist leads directly to the head lead-in sheave in the bucket, as in a crane-operated unit. The holding line is also attached at the vertical center line.



The new bucket operates on 85 to 100-pounds air pressure—the same pressure required for operation of other shaft drilling equipment.

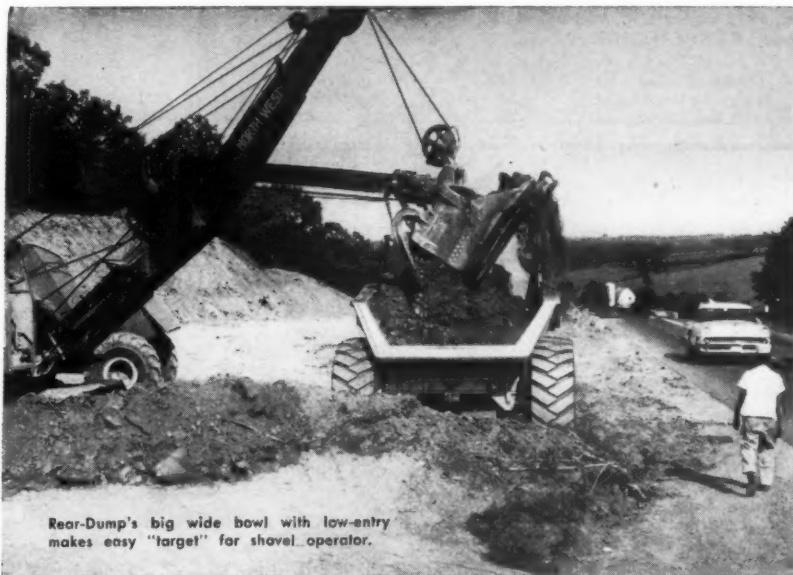
For further information write to the Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa., or use the Request Card at page 18. Circle No. 102.

Hoisting cableway

■ Travelift cableways, which eliminate the button-line assembly and fall-rope carriers, are featured in a folder from a Canadian firm, Construction Improvements, Ltd. Job photos from several dam projects illustrate the folder. Outstanding advantages listed include speeds to 2,000 fpm; the dual-ratio hoist that permits a load to be raised or lowered at normal traveling speed; the single-point suspension that automatically adjusts the lower carriage vertical to the slope of the cable; and a grooved drum which encases the endless line hoist.

To obtain Catalog No. 2 write to Construction Improvements, Ltd., 30 Commercial Road, Toronto 17, Ont., or use the Request Card at page 18. Circle No. 45.

Case history: Maintenance mechanics of Colonial Sand & Stone Co., Inc., New York City, N. Y., have reduced the cost of keeping the company's 400 heavy-duty hauling units in A-1 condition by using coiled wire inserts to repair stripped or worn threads in castings. Ease of installation makes this maintenance-cost saving possible. Here a mechanic installs new threads in a truck engine block with a Heli-Coil coiled wire insert. For more information on these inserts write to the **Heli-Coil Corp.** 1496 Shelter Rock Lane, Danbury, Conn., or use the Request Card at page 18. Circle No. 207.



Rear-Dump's big wide bowl with low-entry makes easy "target" for shovel operator.

Speed 350,000-yd. job

on U. S. Route 460 with 3 Tournapull Rear-Dumps

To widen U. S. Route 460 in Campbell County, Va., from 2 lanes to a 4-lane divided highway, Talbott-Marks Company, Inc., Clarksville, Va., has 350,000 yds. of shale and rock to haul from cuts to fills. Equipment brought in by contractor to handle job included 3 C Tournapull Rear-Dumps and one $1\frac{1}{2}$ -yard shovel.

Production figures on a typical 5000' cycle showed each C Rear-Dump averaged 10 trips per hour. Loads per machine averaged 10 yds. Each rig hauled 100 yards per hour to total 300 yards for the three. Haul route was in fair condition with 7% return grades. Speed and maneuverability of Le-Tourneau-Westinghouse units kept

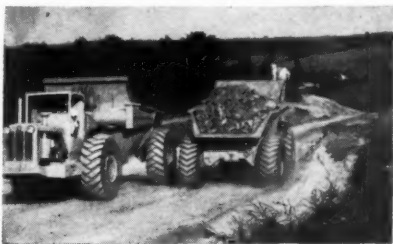
them well ahead of loading shovel. 90° turn-ability of Rear-Dump lets operator swing hauler quickly into position at shovel for elimination of spotting delays.

Owner A. W. Talbott says units are "Very satisfactory." Two of his Rear-Dumps were driven 354 miles to this job from Hereford, Md., in 18 hours, where they had worked on a 300,000-yd. rock section of the Baltimore-Harrisburg expressway.

If you have a hauling problem, it will pay you to investigate the Le-Tourneau-Westinghouse Rear-Dump. Write or call us for further production studies and specifications. There's no obligation.

There's a size to fit your needs

Model	Capacity	HP	Overall Length
D	11 tons	138	25'2"
C	22 tons	208	30'
B	35 tons	293	37'3"
Width req'd, non-stop 180° turn			
Model	Travel position	Dump position	
D	24'8"	19'2"	
C	28'8"	20'8"	
B	35'	27'	



Passing on incline, Rear-Dumps speed along haul route on big, single, low-pressure tires.

Check these advantages as applied to your job

Hauls anywhere — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets... haul cross-country over roughest terrain, through muck and soft fills.

Turns in less space — This Rear-Dump makes 180° non-stop U-turn by power steer in less than its own length. It eliminates time normally wasted see-sawing to back into or turn in narrow quarters.

Reduces maintenance — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, sub-frame, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

Dumps fast, clean — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential automatically applies power to drive wheel on firmest footing... pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening (8'9" x 10'10") is easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

Delivers full power — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires, 24.00 x 25, and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is loss of momentum and all manual work of fighting balky levers.

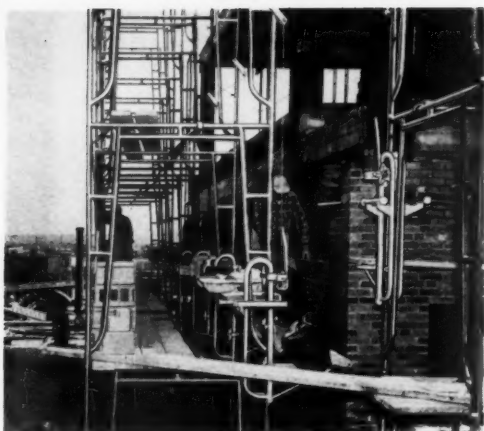
Insures future earnings — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

Tournapull—Trademark Reg. U.S. Pat. Off. R-929-H-b



LeTourneau-WESTINGHOUSE Company
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
For more facts, use Reader-Reply Card opposite page 18 and circle No. 585



Case history: New self-raising mason side brackets, called Safway Mobil-Brackets, are estimated to have saved about 25 per cent of the brick-in-wall costs on this addition to the Minneapolis Grain Exchange Building. The units, which attach to standard scaffolding, elevate both the mason and his material to stay level with the wall. The elimination of lost time spent raising planking and material, and the resulting greater productivity of the masons, accounts for the savings. For more information on these brackets write to Safway Steel Products, Inc., 6228 W. State St., Milwaukee 13, Wis., or use the Request Card at page 18. Circle No. 208.

material, and the resulting greater productivity of the masons, accounts for the savings. For more information on these brackets write to Safway Steel Products, Inc., 6228 W. State St., Milwaukee 13, Wis., or use the Request Card at page 18. Circle No. 208.

The new Ken-Roll general-purpose roller has a clearance of 1/2 inch on the right side for rolling close to curbs and other obstacles.



Announce newest model of 1 to 3-ton roller

Increases in weight range, as well as operator safety and comfort, represent the principal improvements incorporated in the new Ken-Roll 1 to 3-ton general-purpose roller manufactured by the Pfahler Mfg. Co.

The roller weighs 1,800 pounds empty, 2 tons with water ballast, and 3 tons with water and steel ballast. The operator's seat is now more fully enclosed, has cushions, and is adjustable up and down as well as back and forth. An engine heat shield adds to operator comfort.

The Ken-Roll has a clearance of 1/2 inch on the right side to permit rolling to be done close to curbs, walls, and the like. The compression roll delivers up to 85 pounds of pressure per linear inch with water ballast and up to 138 pounds per linear inch with water and steel ballast. The sprinkler tank has a capacity of 93 gallons.

For further information, write to the Pfahler Mfg. Co., Gallion, Ohio, or use the Request Card at page 18. Circle No. 53.

Trench cutter

Earth Equipment Corp.'s Everett Model 60 trencher, for mounting on Ford, Ferguson, and Massey-Harris MH-50 tractors, is described in a catalog. A series of diagrams shows the cutter digging trenches up to 5 feet deep as fast as 300 linear feet per hour. Pictured are the hydraulic drive-on conveyor, belt slip clutch, independent hydraulic system, and bucket line. Complete specifications are included.

To obtain Bulletin 60 write to Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 10.

Hyster plans expansion of Peoria facilities

The Hyster Co., tractor equipment and industrial-truck manufacturer of Portland, Ore., will erect a \$150,000 addition to its Peoria, Ill., plant to expand facilities there. The addition, of steel and masonry construction, will add approximately 25,000 square feet to the present facilities.

Extending 120 feet south of the original structure and 200 feet eastward, the new plant is scheduled for completion in November of this year.

CONTRACTORS AND ENGINEERS

BMCO ROCK BUSTER

THE MIRACLE MACHINE OF THE ROAD-BUILDING INDUSTRY



NO JAWS, ROLLS OR GRIZZLIES

Pulled behind any tractor or grader that will bridge the window, the rock-buster reduces objectionable oversize boulders to money saving base material completely and efficiently in one operation. Also perfect for reconditioning scarified asphalt top material.



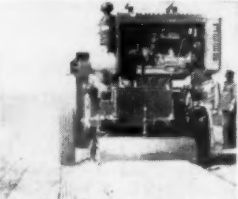
ONE TON HAMMER ASSEMBLY

Eighteen hammers... each weighing 35 lbs... swing out to a diameter of 38" revolve at 1000 RPM just inches above the ground. The Rock-buster doesn't beat rock into the ground.



PIPELINE CONSTRUCTION

Rock which has been a costly problem can now be reduced in place for use as padding material around pipe as well as leaving a clean right of way where desired.



BMCO AND ROCKBUSTER ARE COPYRIGHTED TRADEMARKS OF THE BROWNING MANUFACTURING CO.



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For more facts, circle No. 586

Leading Contractors Demand the Genuine "Mobile Office"



Ideal for—Offices • Drafting Rooms • Paymasters • Timekeepers • Engineers and many other uses conforming to the contractors' particular needs.

Mobile Offices come equipped with drafting tables, desks, lavatory, air conditioning (optional), heater, etc., and can be equipped to your specifications. Units are built for rugged use. Many of these units are being used by leading contractors throughout the U. S.

Write today and get the complete facts on how mobile units can work for you.

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7300 Stony Island Avenue, Chicago 49, Illinois
PHONES DORchester 3-1048-9

For more facts, circle No. 587

MAYO PNEUMATIC GROUTER and "PEA SHOOTER"

The Mayo Pneumatic Grouter has performed capably on jobs ranging from tunnels, mines, and shafts to foundations and railroad subgrades. Simple and efficient in operation, it may also be used for injecting chemical soil stabilizers into caving or running ground. For grouting back of lagging in rock tunnels or back of liner plates in soft ground, the Mayo Grouter is readily converted to a "Pea Shooter" for shooting Pea or "Bird's Eye" gravel. The Mayo Pneumatic Grouter has no moving parts within the Grout... gives years of trouble-free service. Shop tested to twice working pressure. Capacity: 3 1/2 cu. ft., charging height: 3 ft.

For complete details and specifications, write for Free Bulletin 13



MAYO
TUNNEL & MINE EQUIPMENT
LANCASTER, PA.

For more facts, circle No. 588



Steel Forms
Headframes
Muck Bins
Shields-Air Locks
Locomotives
Mine Cars
Grouters



Tractor-pulled loader digs, loads, and mixes

■ A tractor-pulled loader that reportedly digs and loads up to 4 cubic yards per minute has been introduced by J. R. Prewitt & Sons. Weighing 2,200 pounds, the Willimon Mobil-Loader has an 18-inch, four-ply, 28-ounce rubber conveyor belt.

The machine hooks on to the drawbar of any tractor having power take-off. It handles windrows up to 48 inches wide and has a loading discharge height of approximately 8 feet. The rotary tiller digs up to 6 inches deep and cuts a swath 24 inches wide.

The manufacturer states that the rig not only digs and loads original soil, but mixes and loads sand, clay, and topsoil, levels shoulders on highways, cleans out ditches, and is excellent for snow removal.

For further information write to J. R. Prewitt & Sons, Pleasant Hill, Mo., or use the Request Card at page 18. Circle No. 82.

N. Y. Trap Rock holds two geology exhibits

The New York Trap Rock Corp., New York, N. Y., presented its colorful geology exhibit at two gatherings of professional engineers in the New York-New Jersey area last month. Made up of samples of most of the rocks found in the Hudson Valley, the exhibit identifies each rock, gives the origin of each, and provides a brief history of the area.

Members of the New York State Society of Professional Engineers and the joint convention of the National Society of Professional Engineers with the New Jersey society viewed the demonstration.

Vibrating rollers

■ Two folders describing vibrating rollers are available from the Essick Mfg. Co. The Model VR-54-T, a trailer-type roller, is said to compact 18 inches of granular material in six to eight passes. According to the specifications chart, the unit has an over-all width of 61 3/4 inches, and an over-all length (including hitch) of 85 1/4 inches. For patching asphalt pavement, the Model VR-28-W is recommended. This self-contained, self-propelled roller is said to compact 27 cubic yards of backfill per hour. The specifications chart states that the low and high traveling speeds of this model are 60 and 115 fpm, respectively.

To obtain Forms No. 4-L-8 and 4-L-9 write to the Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 122.

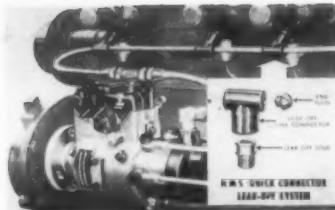
The Willimon Mobil-Loader attaches to the drawbar of any tractor having power take-off and has a maximum capacity of 4 yards per minute.

New leak-off system is easy to install

■ An engine leak-off system that consists of two fittings at each nozzle plus one end-plug for the entire injection system has been developed by The Hartford Machine Screw Co. The system is said to be easy to install or disconnect, and to withstand return oil pressure.

Used in conjunction with engine fuel injectors, the leak-off system drains off excess fuel.

For further information write to



The H.M.S. leakoff system.

the Roosa Master Fuel Injection Division, The Hartford Machine Screw Co., 92 Deerfield Road, Hartford 2, Conn., or use the Request Card at page 18. Circle No. 149.



Four work speeds, 1.8 to 6.4 mph, provide the best power and speed for each particular job assignment.

Today's big news in motor graders

is the all-new 60 hp ADAMS "220"

Here is a low-priced grader with big capacity for hard work. Weighing 14,865 pounds, powered by a 60 hp diesel engine, "220" handles many jobs done by larger machines, saves you money on general grading and road maintenance. Big in value, Adams "220" out-works, out-maneuvers any grader in its size and price class.

Works like a big machine

Like the larger Adams machines, the "220" has 4 working speeds under 6.5 mph, and 4 optional "creeper" speeds for full use of engine power in slow, rugged, or precise work. Travels job-to-job up to 18.3 mph.

Blade controls are straight-line-thrust hydraulic. Moldboard swings from ditch-cut to 90° high bank-cut, on either side of grader, in less than a minute, without operator leaving cab. 10-ft. slide-shift moldboard has 6 pitch positions, and reaches 54 1/2" outside wheels. Leaning front wheels, hydraulically operated, offset side thrust, make short turns possible. Wide tread (76" front, 77" rear) gives stability, safety, and easy handling on slopes.

Built like a big machine

"220's" big 10:00 x 24 tires on all six wheels give firm footing and minimum

rolling resistance. Sturdy 4-wheel tandem-drive utilizes full engine power, provides push-power and traction for doing many of the heavier jobs. Rugged diesel engine is cranked electrically, starts quickly in all seasons.

Optional cab, open or enclosed type, has 6'4" inside height, floor to ceiling, without use of "foot wells".



Operator controls blade movement from cab, swings moldboard ditch-cut to 90° high bank-cut on either side of grader, in one continuous motion. Exclusive gear assembly multiplies hydraulic ram action, 3 to 1.

Sturdy one-piece, rectangular-welded-section frame, and strong Y-shape drawbar, withstand punishing shocks and stresses. Arched frame provides 17" blade clearance to clear shoulders when climbing out of ditch.

Anti-friction steering, and smooth, fast-acting hydraulic brakes give operator confidence to work or travel at highest practical speed.

Scarifier, power-shift moldboard, 12' moldboards, cab, and other accessories, available as optional equipment.

See Adams in action

We will be glad to prove to you that "220", as well as larger Adams graders, work harder, faster, and at lower cost than other graders of similar size and power. Why not call or write and ask for a competitive demonstration?

Model 220... 60 hp... 14,865 lbs.
Model 330... 80 hp... 20,500 lbs.
Model 440... 104 hp... 21,500 lbs.
Model 550... 123 hp... 23,500 lbs.
Model 660... 150 hp... 27,730 lbs.

AG-44-G-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 589

Office machine cuts cost of field work

All-purpose accounting machine enables contractor to keep daily check on costs; simultaneous records insure accuracy

by **G. C. STEWART**, Partner
Elwin G. Smith & Co.
Pittsburgh, Pa.

Eagerness to invest in money-saving equipment for the field and reluctance to increase "office expense" by purchasing modern business machines is one of the inconsistencies of the construction industry.

This is difficult to understand, par-

ticularly since office equipment costs far less than construction machinery but is capable of saving a greater amount of money for a contractor. Indirectly, the right office machine can also save money on field work, too, because it provides up-to-date

and accurate records for every phase of the business, including job costs.

Bookkeeping

As a supplier and subcontractor specializing in industrial construction, our bookkeeping problems are much the same as those of any other construction firm. All of our work is done on a single all-purpose accounting machine made by National Cash Register Co., Dayton, Ohio, and since its installation, one person in our payroll department and one person in our general accounting department have been able to assume additional duties. In other words, the unit has paid for itself in less than a year.

We run about 150 to 200 jobs at one time, and all costs are maintained on individual job-cost ledgers. Material costs are posted directly from the accounts payable unit tickets, and labor postings are made from the payroll summary.

Billings, payments, net accounts-receivable balance, labor, insurance and taxes, material costs, and other expenses, entered in individual columns on the ledger, accumulate as entries are made. The machine automatically computes the figures in each column and prints the total costs. It then prints the net profit or loss to-date on the job.

The profit or loss column gives a progressive picture of billings in rela-

tion to job costs. A high red figure (loss) might appear if the proper billing has not come through; an unusually high black figure (profit) could indicate that some cost has not yet come through. In either case, an investigation is made.

All superintendents in the field keep a close watch on costs. The job ledgers are never more than three days behind at any time, enabling us to check extraordinary figures while the job is still in progress. A glance at the ledger card tells the whole story of the job, including the status of accounts receivable.

Material sales

Sales of material are simultaneously posted and journalized to individual accounts-receivable ledgers. The cost-of-sales columns represent shipments from inventory, including labor, warehousing, engineering, and detailing; while another column records the cost of sales from accounts payable. Again, the profit or loss on each account is figured and printed by the machine, and journal totals are added automatically. A similar journal form is used for posting cash receipts.

Accounts payable

An all-in-one method is used to process accounts payable. Invoice amounts are distributed to individual

Low Cost Rock Drilling with . . .

SYNTRON

Gasoline Hammer ROCK DRILLS



Drilling a horizontal hole in rock.

Syntron Gasoline Hammer Rock Drills will drill holes to a 13-ft. depth at the rate of 2 ft. per minute. More than 2,000 powerful blows per minute plus automatic drill steel rotation plus a sharp air blast that blows out dust and cuttings provides this low cost drilling. Syntron Gasoline Hammer Rock Drills are portable, 100% self-contained tools—no air compressor hose, battery or cable to hamper operation.

SYNTRON

Gasoline Hammer PAVING BREAKER

Rugged, economical, 100% self-contained unit. No air compressor is needed. Easily portable, one-man operation. 2,000 powerful blows per minute, governor-controlled. Reduce job-time on cutting, busting concrete, digging or tamping back fill.



WRITE FOR COMPLETE CATALOG — FREE

SYNTRON COMPANY

227 Lexington Ave.

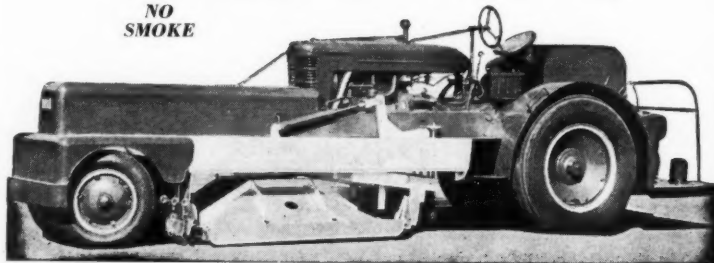
Homer City, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 590

HEATS, SOFTENS but does NOT Burn the Asphalt

Reducing Flame for Intense Heat, Efficient Planing

NO
SMOKE



THE MONATCO ASPHALT HEATER-PLANNER

• Separate engine powers fuel and air pumps—delivers only enough primary air to burn fuel completely. Will not ignite gases rising from pavement.

• Strict control over secondary air in the hood setting—maintains the reducing flame.

Intense, uniform heat (2000° F.) under the hood. In one operation, with one operator this machine heats, softens and planes up to 1" deep, 78" wide. Fills and seals cracks. Leaves

pavement raw, clean, the same as newly laid. Unbelievably low cost of operation, reported in some cases as less than 10 cents per yard!

U. S. Patent No. 2,705,906. Ask for complete specifications and cost operating data.

MONATCO MFG. CORPORATION, 1401 Woodland, Kansas City, Mo.

A few excellent distributorships still available. Write.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 591

CONTRACTORS AND ENGINEERS



Cost accounts are kept on this all-purpose National Cash Register unit. The lower keyboard is for the machine's electric typewriter, used for writing checks. A check register is a by-product of this operation.

unit tickets at the left and vouchered at the right. A National Class 31 machine then indicates that the amounts distributed were, in total, the same as the amounts vouchered, by printing a ".00" proof at the end of the line. The machine shows any error in a particular voucher or distributor ticket by printing the amount of the error instead of the ".00".

The unit tickets, sorted by account, are used as posting media for the individual job-cost ledgers or accounts-receivable ledgers and for making miscellaneous entries to the general ledger. The tickets are numbered in sequence, so that if one were lost, we could quickly trace the missing amount by reference to the journal. The voucher-check is divided into two parts, one to act as a remittance advice to the vendor, and the other to serve as a voucher. The checks, also written by machine, are automatically dated and numbered. A

check register is prepared as a by-product of this operation.

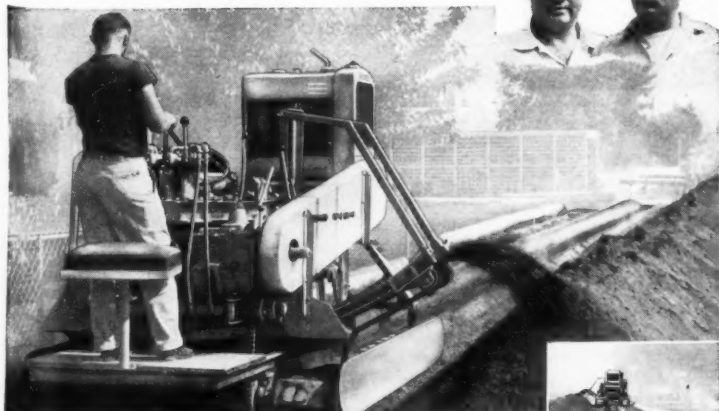
Payroll

Computing the payroll for about 225 employees is another all-in-one machine operation. The employee's earnings record, pay statement, either a check or a payment receipt, and the payroll journal, are written at the same time. Gross and net pay, along with to-date totals for earnings, F.I.C.A., and withholding tax are computed and printed for each employee. The journal columns, including individual-deduction columns, accumulate vertically as figures are entered.

The payroll is written and totaled by job number and it is from this summary that the labor costs are entered on the job-cost ledgers. The fact that earnings, withholding tax, and F.I.C.A. are always automatically totaled to-date on each earnings record.

(Concluded on next page)

"WE MAKE MORE MONEY USING OUR POW-R-DITCHERS"*



*Say Russell Bier and Gene Stewart
BIER & STEWART CONSTRUCTION CO., Palmyra, Mo.

"Our 524T Pow-R-Ditcher makes us more money per dollar invested than any ditching machine on the market. We do better work and our customers are better satisfied. We can underbid when the Pow-R-Ditcher is on the job."

Write for Name of Nearest Dealer & Full Information

Learn about 524T Pow-R-Ditcher... it's ideal for contractors, municipalities, utility companies, etc. Digs 8" to 24" wide, and digs for less because it costs so much less! Self propelled and one-man operated. Smaller Vermeer Pow-R-Ditcher models available.

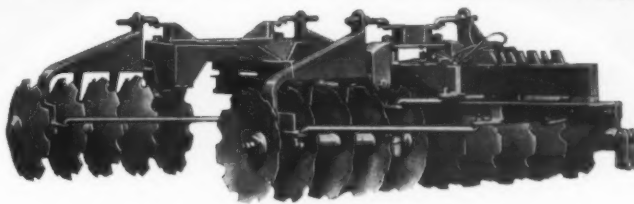
Some Excellent Sales Territory Available

VERMEER MFG. CO. Pella, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 592

JUNE, 1956

...for real **BIG SAVINGS** in Money, Labor and Down Time-it's the **AMCO Brushmaster**



a plowing disc harrow

Rugged, reliable specifications are built into this machine giving you the dependable performance thousands have come to expect from Alexander farm and industrial equipment. This Plowing Disc Harrow is the answer to your mixing, compacting, aeration and land clearing problems for roads and right-of-way work. After giving it a try you'll certainly agree that this big plowing tandem does the job wherever heavy discing and brush clearing work is required.

ALEXANDER MANUFACTURING CO.
P. O. Box 407 — Dept. CE — Picayune, Miss.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 593

Eliminate STEP CUTTING



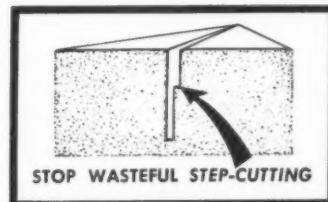
ONE BLADE
ONE PASS
ONE WIDTH

cut costs **50%**

with **carbide bonded blades**

With ordinary, quick-wearing, diamond blades, antiquated "Step-Cutting" is a necessary and costly waste. In order to maintain uniform and easy to fill joints two separate passes must be made thereby doubling the cost of blades, labor, overhead, machines, water, gasoline, etc.

After years of research and development Consolidated has succeeded in blending diamonds in a CARBIDE matrix. CARBIDE is the toughest, most durable of all metals.



RESULT: The new Carbide Bonded blade cuts a clean, constant width, easy to seal joint in one pass. Although field reports show Carbide blades last 2 to 3 times longer than all ordinary diamond blades, the cut virtually remains the same width throughout the life of the blade.

Write today for full information and prices.



**Consolidated
DIAMOND TOOL CORP.**
320 Yonkers Avenue, Yonkers, N. Y.

*Patents Pending.

CONCRETE AND MASONRY CUTTING BLADE DIVISION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 594



Delair built for Amer. Dredging Co.

Transport Men, Materials with Speed and Safety

- 40-ft. long, 12-ft. beam
- Welded steel construction
- Diesel powered
- Carries up to 35 men
- Portable — moves over land on tractor-trailer
- Low maintenance

For bridge, drilling, dam, pipeline, crib, dredging, or any other off-shore work. Contractors have found the HANSEN SEA-TRUCK a "Pick-up truck on water". It transports men and materials to and from the job . . . even does light towing!

Built by one of the oldest and best known companies: Standard model is complete with lavatory, toilet, horn, life jackets, running lights, etc. Many optional features available or special model can be designed to meet your needs. No licensed crew necessary.

Write or wire for basic specifications . . . or let us submit drawings to your requirements.

HANS HANSEN WELDING CO. 2824 Summit Street
Toledo 4, Ohio

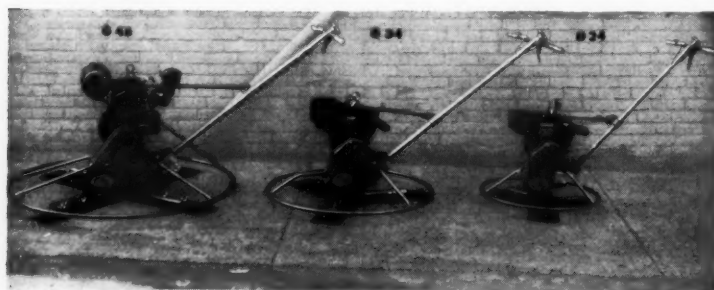
For more facts, use Reader-Reply Card opposite page 18 and circle No. 595

News about CONCRETE FINISHING



Here is a really smooth finishing job done on a super market floor with the STOW G-34 Roto-Trowel. Note that the operator was able to trowel right up to the walls, because of the rugged, stationary guard ring. According to men in the field, the new STOW trowel is the most advanced, best engineered trowel on the market; and it makes possible extremely smooth surfaces.

The STOW G-34 Roto-Trowel handles easily. It has many important safety features, such as the fool-proof, dead-man clutch control that stops blade rotation the instant the operator releases the handle. The engine remains running, thus eliminating the necessity of re-starting the engine. For complete information about the complete line of STOW Roto-Trowels, write today!



46" Roto-Trowel			34" Roto-Trowel			New 24" Roto-Trowel		
Model No.	Trowel Diameter	Ring Diameter	Engine	Trowel Speed	Float Trowels	Finish Trowels	Operating Weight	
G-24	24"	25"	Briggs & Stratton 2.2 HP	35 to 130 RPM	6" x 10"		69 lbs.	
G-34	34"	35"	Briggs & Stratton 2.5 HP	25 to 100 RPM	10 x 14"	6 x 14"	145 lbs.	
E-34	34"	35"	G.E. Fan-Cooled 1 1/2 HP	90 RPM	10 x 14"	6 x 14"	139 lbs.	
G-46	46"	48.5"	Wisconsin - BKN 6.8 HP	25 to 100 RPM	10 x 18"	6 x 18"	212 lbs.	

STOW STOW MANUFACTURING CO.
40 Shear Street, Binghamton, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 596

All costs are maintained on these individual job-cost ledgers along with records of accounts receivable. Any outsized profit or loss figure, the difference between the amount billed and the total cost, is checked immediately.

(Continued from preceding page)

ord has simplified making quarterly and year-end state and federal reports. The machine also prepares W-2 and 941a forms.

Mechanical bookkeeping methods save both time and money since many related records are prepared in one operation by machine. For instance, in the accounts-payable computation, the distribution, vouchering, preparation of remittance advice and journalizing are all accomplished in one motion. All payroll records are made together. This can be done safely because of the machine-controlled proof.

On the other hand, pen-and-ink methods require duplication of effort because everything must be done twice in order to effect a proof. The machine system eliminates the problem of tie-in errors since all records are created simultaneously—if one is right, they are all right; if one is proved, they are all proved.

Simplicity is another factor. It is literally easier to operate a modern accounting machine than it is to write with a pencil. Figures are entered in adding-machine style, and names and descriptions are typed in

by the machine's electric typewriter. The quick, easy, and accurate method of streamlining office procedures has effected savings in time and money for our office, just as modern equipment has effected savings in the field. THE END

Western plant to be built by Insley Manufacturing

Manufacturing facilities providing an initial 150,000 square feet of space, and that will eventually furnish 250,000 square feet of space, is scheduled to be built in Puente, Calif., by Insley Manufacturing Corp., Indianapolis, Ind.

Insley, maker of excavators and crane equipment, will share the facilities of the new plant with the Maxi Corp., a wholly owned subsidiary. The new plant, to be located on a 35-acre site, will contain two 75 x 500-foot bays for production and assembly, a machine shop, parts and service department, traffic docks, test areas, and facilities for field research and development. Engineering, sales, and administrative offices will also be located at the plant, which will supply the western market and the Pacific export area.

PROOF THAT POWER-PACK DOES THE JOB FASTER...LESS SPILLAGE

YES, PROGRESS REPORTS
PROVE SPEED
AND EFFICIENCY



In a careful study of more than twenty different construction jobs replacing fine aggregate, the job records definitely showed a report of outstanding speed and a greater savings in labor required.

The Power-Pack Backfiller, ruggedly built for long and dependable service, is easily portable with four swivel wheels and a sure quick hitch. Can be used with any size dump truck, including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy-duty carrying belt.

Write for literature describing advantages and features of Power-Pack Backfiller.

POWER-PACK CONVEYOR CO.
13910 ASPINWALL AVENUE • CLEVELAND 10, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 597

CONTRACTORS AND ENGINEERS



Latest in new line of tractors designed for industrial and light construction use is the International 600.

Operator comfort feature in design of new tractor

■ Comfort and convenience of the operator, as well as mechanical improvements, were considered in designing the new International 600 Series wheel tractor, according to the International Harvester Co.

The new tractor is equipped with Hydra-Touch; easier steering; a large, roomy platform for the operator; crown-type fenders; complete cowl shielding; roller-type swinging drawbar; improved cold-weather diesel starting; and an up-to-date instrument panel. It is available with either gasoline or diesel engine.

The International 600 has easier steering, according to the manufacturer, because of a change in the steering ratio. Also available is a hydraulic power steering assembly powered from the tractor's Hydra-Touch system. Operator comfort and convenience are aided by a foam-rubber-

padded seat, double cushioned with a coil spring, and hydraulic shock absorbers. This seat tilts back, can be adjusted forward and backward, and can be swung right or left out of the operator's way if he wishes to stand while driving.

The large flat platform with non-skid floor plate provides plenty of comfortable standing room, and the crown-type fenders together with complete cowl shielding are designed to reduce the amount of dirt and dust blown toward the operator. A one or two-valve Hydra-Touch hydraulic system to control single, tandem, or multiple hook-ups is available for the new machine.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 400.



MILLER "B" 6 ton
\$895.00* F.O.B. Milwaukee
Any optional equipment extra
*Plus Freight and 8% Federal Tax

Whatever you haul . . . dozers, rollers, trenchers, front-end loaders or backhoes, you'll load them faster . . . slash between-job-hauling time with a MILLER Tilt-Top! ONE man can tilt, simply drive the equipment onto the broad, oak decked platform, be on his way in less than two minutes! Available in a variety of single or tandem-axle models, there's a MILLER Tilt-Top to match your equipment needs. See these time saving, production boosters at your MILLER distributor today—you'll be surprised at how ruggedly they're built—how little they cost!

✓ built best
✓ priced best

See your MILLER distributor
or write for FREE literature to:

Miller
Tilt-Top Trailer Co.

456 S. 92nd St., Milwaukee 14, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 598

KONKURE Concrete Curing Compounds



Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications. Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures* or rainfall damage.

*In hot, dry areas, use of Konkure White is especially recommended.

GENERAL PURPOSE

KONKURE Clear — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

KONKURE White — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

KONKURE Black — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

KONKURE Gray — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.



TILT-UP and LIFT-SLAB

KONKURE P. C. C. — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Write or Phone for full information

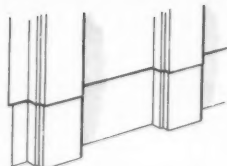
KONKURE COMPANY

6742 Stanton Avenue, Buena Park, California + Phone: LAwrence 2-2841

For more facts, use Reader-Reply Card opposite page 18 and circle No. 599



NOW MAKES
30'-40'-50' CLEAR SPAN
RIGID FRAME
STEEL BUILDINGS



Special interlocking corrugation provides weatherseal joints.

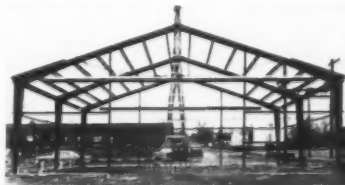


Patented Clip-and-Wedge assembly speeds erection, saves money.

Designed for both
LIGHT and HEAVY DUTY
industrial, farm and
commercial uses.

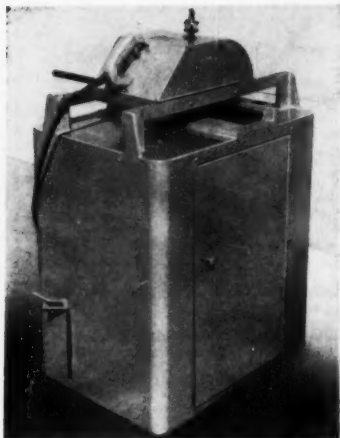
USF's popular truss-type line of steel buildings has now been broadened with new 30'-40' and 50' span Rigid Frame designs. Used singly or in multiples, the 30' clear spans are available in 10'-8" or 12'-8" eave heights; 40' and 50' clear spans in 14'-8" eave heights. Any length in 20' multiples is possible. Easily individualized, you can locate doors and sash anywhere and choose from a large selection of accessories.

USF Rigid Frame Buildings are economical in first cost, and patented erection method makes additional savings in time and money. For complete information, WRITE FOR DESCRIPTIVE BULLETIN.



UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 600

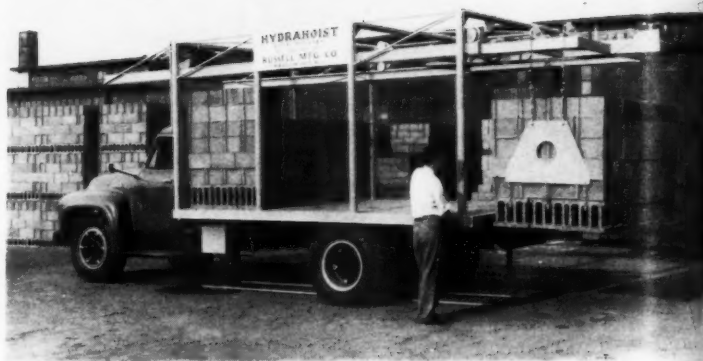


The Collins Copper Cut saw uses standard 110-volt electric power.

No reaming necessary with new copper saw

■ A new saw designed for cutting copper has been introduced by the Collins Machinery Corp. It is reported that the saw will cut copper without a burr on either the inside or the outside, making reaming unnecessary. Made of aluminum, the Copper Cut saw weighs approximately 90 pounds. It uses standard 110-volt electric power and will cut from seven to eight pieces of $\frac{3}{4}$ and $\frac{1}{2}$ -inch copper tubing at one time. A length indicator assures accurate cutting.

For further information write to the Collins Machinery Corp., 5474 Alhambra Ave., Los Angeles 32, Calif., or use the Request Card at page 18. Circle No. 94.



New truck body contains built-in trolley hoist

■ A new truck body marketed by the Russell Mfg. Co. is said to make possible substantial reductions in the cost of hauling blocks, bricks, tanks, stone, gravel and other materials, because of its built-in traveling hoist. Known as the Hydrahoist, the new body mechanizes loading and unloading with hydraulic power activated solely by the truck engine.

A bridge-type superstructure of lightweight tubular steel is the main feature of the Hydrahoist. Adjustable cables, working over roller-bearing trolley wheels, transmit power for lifting and moving as the trolley telescopes forward or backward. Controls at the rear permit one man to regulate movement, the manufacturer states.

An open framework makes it possible to load the Hydrahoist with forklifts from the rear and both sides. The hydraulic equipment in the superstructure allows lifting or lowering at the rate of 6 inches per second for loads as heavy as 4 tons. The adjustable cables permit the rig to unload up to 18 feet below tire level.

For further information write to the Russell Mfg. Co., 1328 Maple Ave., Haddon Heights, N. J., or use the Request Card at page 18. Circle No. 142.

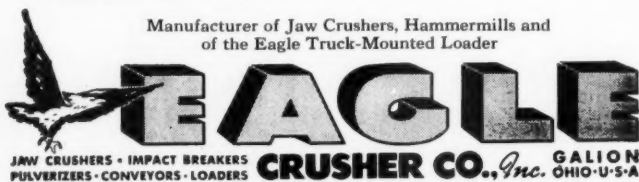
Loads as heavy as 4 tons can be handled by the built-in hoist on the Russell Hydrahoist truck body.



It's mobile, modern, has higher capacity . . . it's an EAGLE

You'll like the mobility feature—cross-country, around the yard—and you'll find its 120–125 yds. output per hour a profitable performance under most conditions.

If you are involved in highway construction it will pay you to investigate the advantages of this unit. Write!



For more facts, use Reader-Reply Card opposite page 18 and circle No. 601

KINNEY MODEL SD848 ROTARY PLUNGER ASPHALT PUMP CHOSEN FOR SIMPLICITY'S NEW 4-TON PUG MILL MIXER!

When the Simplicity System Company, division of West Construction Co., Chattanooga, Tennessee designed this 4-ton capacity pug mill mixer, their choice of a Kinney[®] asphalt pump was not surprising. Simplicity has been using Kinney asphalt pumps exclusively since they first started building asphalt plants in 1925 . . . proving that outstanding product quality builds customer satisfaction.

This particular unit was shipped to Ben M. Hogan & Co., of Little Rock, Arkansas who now has three Simplicity plants installed, each equipped with a Kinney Model SD848 steam jacketed pump for rapid and uniform spraying of hot liquid asphalt cement into the pug mill mixer. All Hogan asphalt plants also utilize Kinney SD646 pumps for unloading asphalt from tank cars to storage.

For full particulars on these asphalt pumps request Bulletin L51A which describes the complete line of Kinney liquid pumps. District offices are located in Baltimore, Charleston, W. Va., Charlotte, Chicago (La Grange), Cleveland, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, and The International Sales Office, 90 West St., New York 6, N. Y. . . all competently staffed to discuss your vacuum problems with you. Act today!



KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3531 WASHINGTON STREET • BOSTON 30 • MASS.
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N. Y.

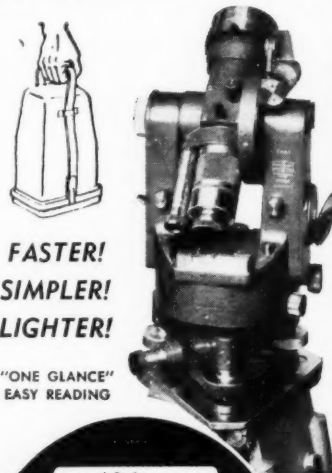
*Please send Bulletin L51A describing our complete line of Kinney Vacuum Pumps.

Name _____
Company _____
Street _____
City _____ State _____

Send Coupon Now!

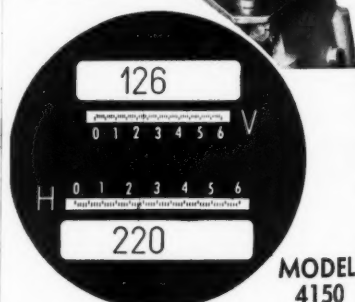
For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 602

LOOK!



**FASTER!
SIMPLER!
LIGHTER!**

"ONE GLANCE"
EASY READING



MODEL
4150

F/S REPEATING OPTICAL TRANSIT

DIRECT Vertical & Horizontal Reading

Eliminates verniers, reading glasses, parallax errors, and stopping around instrument. A glance into the microscope eyepiece gives both vertical and horizontal readings directly to 1' with estimation to 6".

Optical Plummet

Eliminates plumb bob and the delays due to swing and wind action. Looking into plummet (as diagram shows) operator sees plummet circle and ground point.

Repeating Lever

Speeds repetition. Prevents errors.

Motion Secured at Low Temperature (0°F)

Portability

Weights less than 10 pounds. Fits in compact aluminum carrying case.

Full Line of Accessories

Ask for complete literature
Guaranteed for 18 Months

Full Servicing by Our
Factory Specialists

**FILOTECNICA
SALMOIRAGHI INC.**
41-14 24TH STREET,
LONG ISLAND CITY 1, N. Y.

For more facts, circle No. 603

CONTRACTORS AND ENGINEERS



Wearing just as well as new tires is this pair of 27.00 x 33 Hard-Rock Lug re-caps on a twin-engine Euclid rig belonging to the W. E. Graham Construction Co., Maryland.

Case history

Recapping experts save expense of new tires

"The Carolina Tire Co.'s preventive tire maintenance and on-the-job servicing has saved us thousands of dollars a year on our tires," reports S. Page Graham, general purchasing agent for the W. E. Graham Construction Co., contractor for part of the expressway being built in Maryland between Baltimore and Frederick.

"We find that recapping and repairing earthmover tires has saved us about 50 per cent of what new tires cost, and the recapped tires run just as long."

The cost of a new tire for one of the mammoth earthmoving machines can run close to \$4,000. The Carolina Tire Co. specializes in servicing these tires for contractors, and maintains more than 2,000 service dealers in 30 states, Canada, and some foreign countries.

For more information on the firm's preventive tire maintenance and on-the-job servicing write to The Carolina Tire Co., 232 N. Main St., Salisbury, N. C., or use the Request Card at page 18. Circle No. 193.

Dryer combustion units

Two dryer combustion units for rotary dryers are featured in a folder from the manufacturer, Hopkins Bros. The oil type and oil-gas type units are said to be matched capacity-wise to today's high-production asphalt dryers. Data is given on the installation, operation, and fuel consumption of these units.

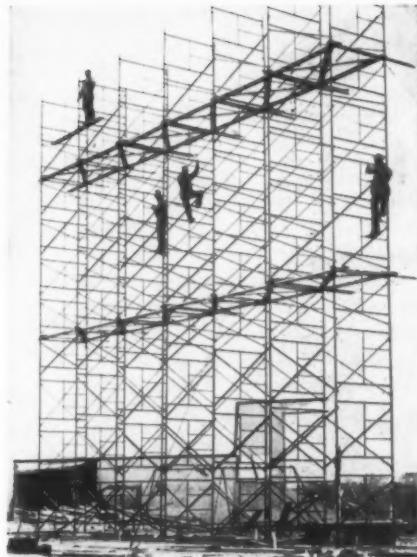
To obtain Bulletin No. 108 write to Hopkins Bros., P. O. Box 387, Alliance, Ohio, or use the Request Card at page 18. Circle No. 118.

Drafting machine

The Walpole-Nordquist portable drafting machine that reads every degree from 90 through 0 to 45 degrees, is described in a brochure from the manufacturer. A diagram points out the automatic lock that is said to quick-set every 15 degrees and permits 90 per cent angle work with one-hand control.

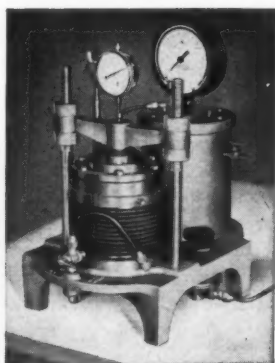
To obtain the brochure write to The Walpole Co., 419 Boylston St., Boston 16, Mass., or use the Request Card at page 18. Circle No. 42.

Case history: When a severe wind storm completely demolished a drive-in theater's movie screen at Grand Forks, N. Dak., the Steen Construction Co., Grand Forks contractor, put up this temporary screen structure. Using 84 frames of Waco 4 x 5-foot tubular scaffolding, the contractor was able to assemble the new structure and install a new screen in a day and a half. For more information about Waco scaffolding write to the Waco Mfg. Co., 3565 Wooddale Ave., Minneapolis 16, Minn., or use the Request Card at page 18. Circle No. 209.



For Efficient Consolidation Soil Testing You Need..

an
OLSEN
Conbel



- Infinite choice of loads up to 10 tons per square foot on 2 1/2" dia. sample
- Floating bellows—eliminates eccentric loading
- Instantaneous load application
- Compact—less than 1 1/2 sq. ft. of table space
- Simplified controls—one man operation
- Light weight—portable

For information about the Conbel and other soil testing equipment in the Olsen line, write for Bulletin 50.

TINIUS OLSEN TESTING MACHINE CO.
2100 Easton Road Willow Grove, Pa.

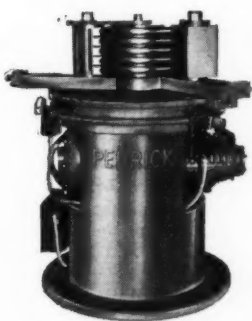
For more facts, circle No. 604

extra!

ALL ABOUT THE LATEST BENDING METHODS

Let Pedrick show you how the latest methods of bending pipe, tube and structural metal—on a job or production basis—can save you money.

For full information on Pedrick Production Benders, write PEDRICK TOOL AND MACHINE CO., 3640 N. Lawrence St., Phila. 40, Pa. Dept. 12.



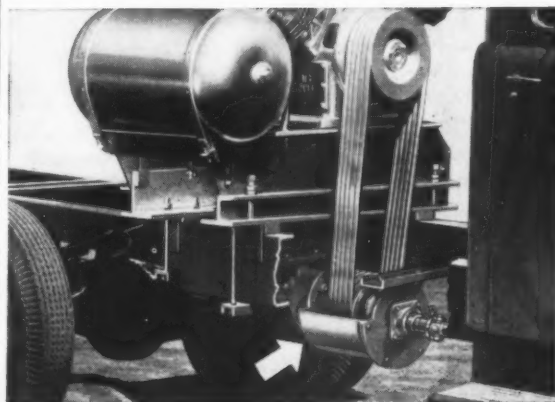
FREE "PEDRICK LINE" BULLETIN, WRITE TODAY.

PEDRICK

production benders

For more facts, circle No. 605

HERE'S MORE POWER TO YOU with a CEMCO split-shaft power take-off



The CEMCO Takeoff becomes a part of the truck drive shaft. Engineered for any truck, regardless of size

The above illustration of a CEMCO Takeoff at work is only one of many applications where the truck motor also powers equipment mounted on the truck. The Takeoff rotates in same direction as drive shaft and at same speed, and, on a typical 2 to 2 1/2-ton truck, delivers 65 to 75 B.H.P. at 1750 RPM. On a heavy-duty truck, at 1750 to 2000 RPM, the delivered B.H.P. will be from 150 to 200.

On the Mobile Machine Shop pictured below, the CEMCO Takeoff drives the combination 300-amp. welder and 15-KW (110-220 v.) generator with the truck's 1750 RPM.

Everything important to the job is at hand—truck, power, and equipment! Send for detailed information regarding your needs. Engineering help available for you, if needed.



This CEMCO Mobile Machine Shop—for maintaining heavy-duty construction equipment—makes over 2,000 tools available for on-the-spot servicing

CEMCO

INDUSTRIES,
INCORPORATED
GALION, OHIO

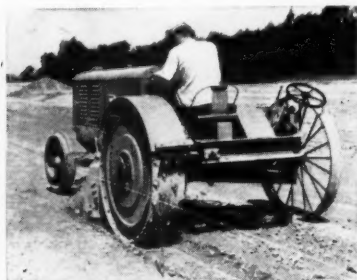
For more facts, circle No. 606

Surfacing for new floors or patching for old ones

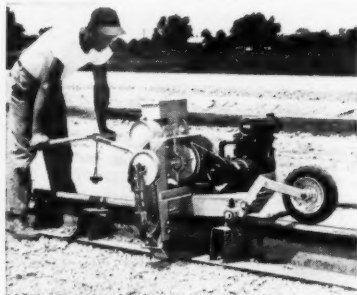
■ A floor surfacing said to resist the attack of acids, alkalis, water, oil, and grease is offered by the Flexrock Co. Rockflux can be applied over new wet concrete, or used for patching or resurfacing old floors in 1/2 inch or thicker lifts.

According to the manufacturer, the material has three times the compressive strength and four times the serviceability of concrete. It is available ready-mixed in proper proportions; only water is added. It sets in 24 hours.

For further information write to the Flexrock Co., 3624 Cuthbert St., Philadelphia 1, Pa., or use the Request Card at page 18. Circle No. 83.



Cleveland Formgrader



Cleveland Form Tamper

This RUGGED PAIR CUTS ROADBUILDING COSTS!

NOW EQUIPPED with hydraulic controls and power steering, the new, improved Cleveland Formgrader will simplify your form setting and do a better job of it at less cost. One man in 6 hours can cut 6,480 feet of form trench, leaving it compacted and rolled—ready for instant setting of forms.

The Cleveland Form Tamper quickly and easily tamps and oils forms, producing a more uniform job at far lower cost than hand labor. When left hand and right hand models are used in tandem the tamping rate is...

50' per minute!

Let this powerful team speed up construction and cut costs for you—as it has for contractors all over the nation! See your Cleveland Formgrader distributor or send coupon today for full information.

CLEVELAND FORMGRADER co.

Mills Road • Avon, Ohio

- ☐ SEND NAME OF NEAREST DISTRIBUTOR.
☐ SEND LATEST LITERATURE.

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____

For more facts, use coupon, or circle No. 607



Blaw-Knox automatic batching systems provide a high degree of accuracy coupled with speed of production. ▼

Automatic batch systems offer speed, accuracy

■ Automatic batching plants said to combine the features of speed and accuracy to a degree unequaled by manual plants are offered by the Blaw-Knox Co. Aggregate batchers with dial-scale control and both single and dual cement batchers comprise the line of electronically controlled equipment manufactured by the company.

The standard aggregate-batching system consists of three separate batchers with electric controls, air-operated gates, and dial scales. The weighing of each material, as well as the interlocking of each batcher, is handled by a set of electronic controls and relays. All controls are accessible from a central operation station.

The aggregate batchers require 115-volt, 60-cycle, single-phase current, and air pressure from 90 to 120 psi.

The company's standard dual cement-batching system features two separate batchers, also with electric controls, air-operated gates, and dial

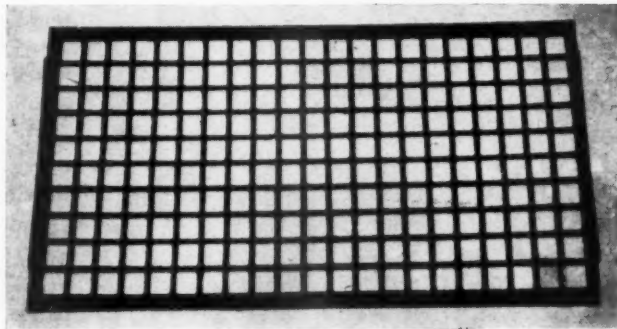
scales. Electronic controls direct the weighing of the cement and the interlocking of the batchers. This dual-batching system is designed to meet the requirements of high-speed highway or turnpike construction, and must be installed on a cement bin having dual outlets on 3-foot 6-inch centers.

A single batcher having the same features and operation characteristics is available for work not requiring extreme speed of production.

According to the manufacturer, these systems will supply 180 batches or more an hour. Accuracy of batch to one-quarter of 1 per cent on cement is possible to conform with turnpike specifications. The electronic controls are said to eliminate the possibility of long or short batches.

For further information write to the Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 271.

This Mold Will Pay For Itself In A Very Few Days



The use of Martin Steel Concrete Molds in Reinforced Steel Erection saves contractors at least 50% of the cost of steel bolster chairs.

These blocks are being successfully used on flat slabs, lift slabs, tube slabs, pan slabs and bridges. The use of concrete blocks eliminates the rust spots on ceilings generally left when bolster chairs are used.

With proper care and oiling after use, these molds will last for years. Sold in sets of three which will take care of beams and slabs from 2" to 10". Immediate delivery. Call or write

Martin Steel Concrete Mold Fabricators 109 Rockwood Ave.
Tel. ELmhurst 1-3422 Cranston 9, Rhode Island

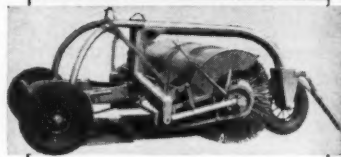
For more facts, use Reader-Reply Card opposite page 18 and circle No. 608

Open web joists

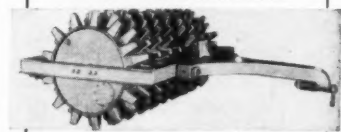
■ Short and long-span open-web steel-joist construction is described in a catalog from the Steel Joist Institute. Such topics as materials, connections, methods of design, stresses, spacing, erection, bridging, floor decks and slabs, and fire-resistance ratings are discussed. Data is given on long-span joists and anchors, extensions, and connections used with them. Standard loading tables for long and short-span joists are included.

To obtain this catalog write to the Steel Joist Institute, DuPont Circle Bldg., 1346 Connecticut Ave. N. W., Washington 6, D. C., or use the Request Card that is bound in at page 18. Circle No. 34.

Grace ASPHALT AND COMPACTION EQUIPMENT



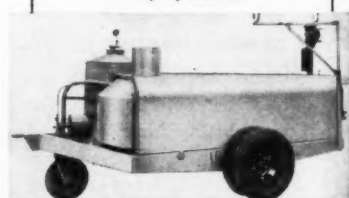
Roadsweepers, traction, engine-driven or tractor-mounted



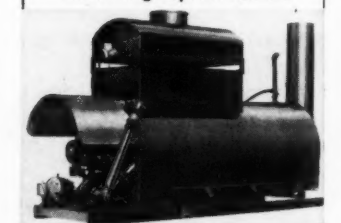
Sheepfoot rollers



Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants



Pneumatic rollers, self-propelled or trailed

W. E. GRACE MFG. CO.

6003 S. Lamar • Dallas, Texas

For more facts, circle No. 609

CONTRACTORS AND ENGINEERS

Develop economical drill for taking earth cores

■ A truck-mounted core drill has been developed by the Gunderson-Taylor Machinery Co. The rig is known as the Model GT-500.

The drill is made up of a Chicago Pneumatic heavy-duty, eight-diamond drill with a hydraulic swivel head and a 24-inch feed, mounted on

The GT-500 core drill made by Gunderson-Taylor Machinery Co.

a Dodge Power Wagon or similar truck. A tower which will accommodate 10 feet of rod extending upward out of the quill of the diamond drill is hinged so that it can fold over the truck cab when not in use.

All hydraulic controls, including that moving the tower to and from the horizontal carrying position, are worked from a Racine hydraulic pump. The power takeoff from the truck engine drives both the water pump, which is a Bean 20 Royal high-pressure pump, and the diamond drill.

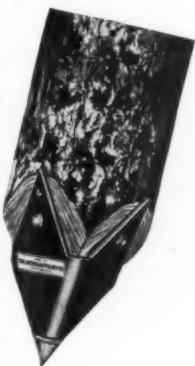
For further information write to the Gunderson-Taylor Machinery Co., 1237 Shoshone St., Denver, Colo., or use the Request Card at page 18. Circle No. 68.



AMERICAN PILE SHOES

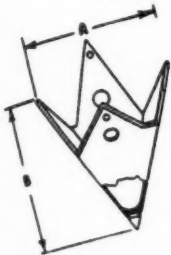
SAVE TIME PREVENT TROUBLE on your pile driving jobs

- **EASY TO APPLY**—Nail-holes are provided for rapid, permanent application.
- **STRONGER**—American Pipe Shoes are made of 1/4" steel plates, accurately formed and solidly welded.
- **CAN'T COME OFF**—Bending holes are provided to permit tailor-made fit. Obstructions cannot push or tear shoe from pile.



Dimensions — Prices

Shoe	For Piles	"A"	"B"	Weight	List Price
No. 1	6" to 9" diam.	7 5/8"	9 3/4"	5 1/2 lbs.	\$2.30
No. 1 1/2	8" to 11" diam.	9"	11 1/2"	7 1/2 lbs.	2.60
No. 2	10" to 14" diam.	11"	13 3/4"	11 3/4 lbs.	3.90



The American Pulley Company

4200 Wissahickon Avenue

Philadelphia 29, Pa.

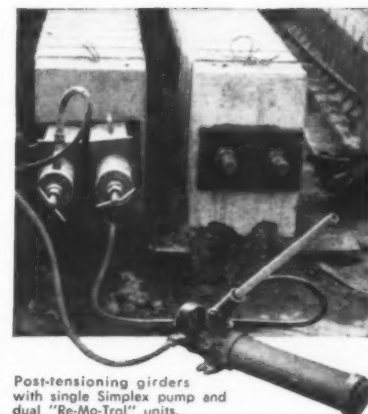
For more facts, circle No. 610

Case history

Versatile rig returns investment in 84 days

Using a Model S-10 Moto-Bug with a fork-lift attachment and a hopper body—attachments that are interchangeable on the same chassis—a contractor on a school-annex job in Wisconsin recovered his capital investment on the self-propelled material-handling rig in 84 working days.

Used as a fork-lift, the Moto-Bug unloaded box cars and flat-bed trail-



Post-tensioning girders with single Simplex pump and dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations Construction Men Acclaim Ease and Safety of Simplex Methods

Concrete prestressing becomes a quick easy task with Simplex hydraulic equipment. Rods, wires and cables can be tensioned without torque, "off-center" pressures or complicated back-up devices because of the "center-hole" pulling feature of Simplex units. This accounts for a 75% increase in ease and efficiency.

The "Re-Mo-Trol" unit consists of a "center-hole" pulling ram connected to a hand, air, electric or gasoline powered hydraulic pump. The combination provides uniform stressing with maximum safety and speed. With the ram in place, the pump can be operated safely from any nearby location.

"Re-Mo-Trol" units are ideally suited for either job site or permanent prestressing bed use. Standard units are available from 10 to 100 ton capacities. They can be used directly on wires, rods or cables for high pressure tensioning, or for pushing or pulling against holding brackets in multiple bed stressing operations.

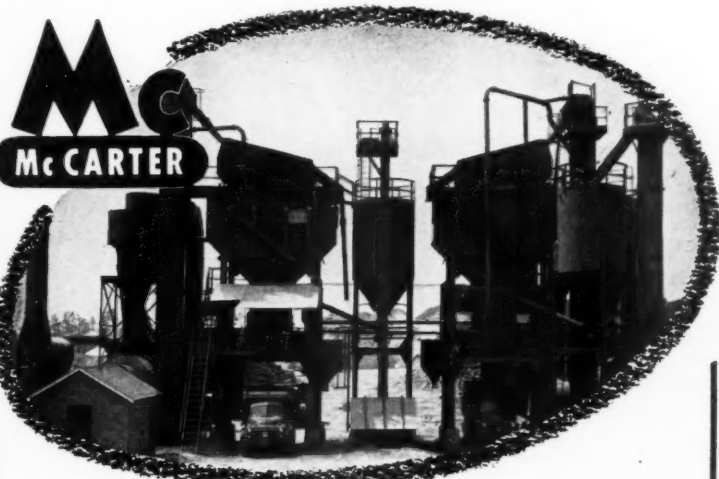
For detailed data on selection and application of Simplex equipment, write for Bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL" — Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. The "JENNY" is a self-contained center-hole hydraulic puller which also serves as a press or heavy duty jack. It is available in capacities from 30 to 100 tons.

TEMPLETON, KENLY & CO.
2511 Gardner Road • Broadview, Illinois

For more facts, circle No. 612



ASPHALT MIXING PLANTS 2000 TO 6000 LB. CAPACITY

20 years experience in design and manufacture of this truly balanced equipment, assures McCarter customers of standardized parts and minimum costs.

McCarter standard plants — designed and manufactured in their own works are readily adaptable to your special requirements. Individual units also available.

DRYERS (hot or hot & cold material, center outlet type)

- MIXERS • ASPHALT BUCKETS (Steam, hot oil or electric heated) • AGGREGATE HOPPERS • BINS • APRON TYPE FEEDERS • CYCLONE COLLECTORS • ELEVATORS • STEEL STRUCTURES

Our Sales Engineers will gladly consult with you!

**Mc
Mc CARTER**

**REPAIRING AND REMODELING
OLD PLANTS—A SPECIALTY**

IRON WORKS, INC. Norristown, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 611



As a fork-lift, the Motobug transports brick from the stockpile to the masons' platform.

ers containing palletized and banded bricks and stone, and stockpiled the material. It also transported the material from the stockpiles to the areas where it was needed.

In 20 minutes, the fork-lift unit was removed from the Moto-Bug chassis and the hopper body attached. Then the machine hauled concrete from truck-mixers to the forms and poured it. Hauling distances averaged between 150 and 200 feet and the Moto-Bug was able to unload a 5-yard transit-mix truck in 35 minutes.

For more information on the Moto-Bug write to the Koehring Co., 3026 W. Concordia Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 202.

Weather charts

The weather outlook for July

The two accompanying maps indicate anticipated weather conditions throughout the United States during the month of July, with regard to precipitation and temperatures.

Those areas indicated on Chart I as being dry will average fewer than six days of rainfall during the month. Medium areas can expect between 6 and 12 rainy days, and wet regions will probably have more than 12 days with rain. Brief showers, however, will account for a good deal of this rain, and not all precipitation will be from all-day rains.

Hot regions indicated on Chart II will experience more than 16 days when the maximum temperature reaches 90 degrees or higher. Between 6 and 16 such warm days can be expected in medium areas, while fewer than six 90-degree days can be anticipated in cool regions. Southern Florida will, no doubt, have only a

very few days when the temperature reaches 90 degrees.

Using the charts in a relative sense, a contractor might note that North Carolina and Atlanta, Ga., will average more rain than New York or St. Louis, Mo., respectively. Similarly, South Carolina and Georgia will have fewer days with 90-degree temperatures than will Mississippi or Arkansas, and Denver, Colo., will probably be cooler than Salt Lake City, Utah.

As indications of average conditions, these charts are not intended to be specific forecasts. Any questions pertaining to these charts or to the applied uses of climatology in the construction industry will be answered by Weather Corp. of America, 39 Broadway, New York 6, N. Y., or 611 Olive St., St. Louis, Mo., which prepares this information for CONTRACTORS AND ENGINEERS.

THE END

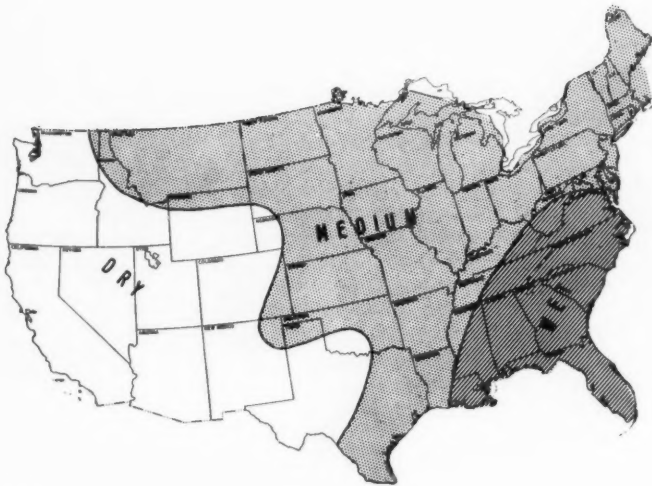


Chart I: Precipitation

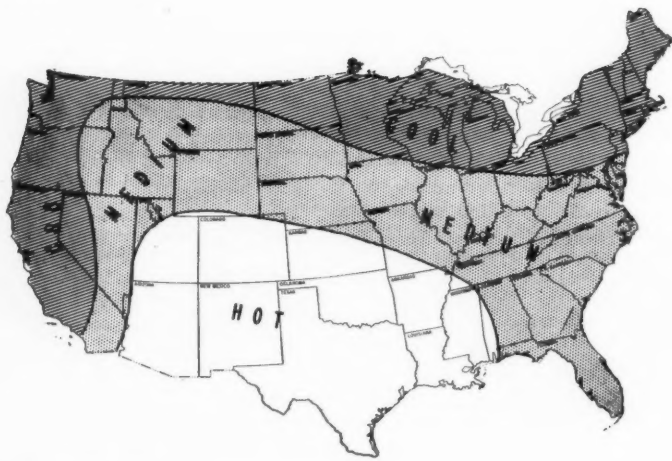


Chart II: Temperature

The cost of paving maintenance for the asphalt pavement of the New Hampshire Turnpike has come to a total of \$2,651.06 for the first five

years of the toll road's existence. The average cost of maintaining one mile of pavement on the 14.7-mile road comes to \$36.07.

write for further information
Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

Speed Sealcoating Jobs
with
SWENSON SPREADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 613

SETS THE STAGE FOR FRESH AIR



When the curtain goes up on underground construction, you're all set when Naylor ventilating lines are part of the scenery.

Naylor pipe provides lightweight lines that can be installed faster and easier. What's more, the exclusive Naylor structure permits the use of lighter gauge material to cut your costs without sacrificing performance.

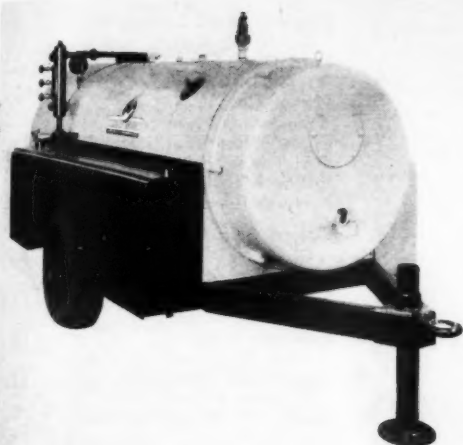
The Naylor one-piece Wedge-Lock coupling is another dependable "prop" that speeds installation of vital air lines. Lines can be assembled with only one side of the pipe in the open and extended rapidly as the work progresses. It's a combination well worth looking into.

Write for Bulletins No. 507 and No. 514.

NAYLOR PIPE

NAYLOR PIPE COMPANY
1270 East 92nd Street
Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York
For more facts, use Reader-Reply Card opposite page 18 and circle No. 614
CONTRACTORS AND ENGINEERS



The Cleaver-Brooks PS-50 portable steamer.

New portable steamer has increased capacity

■ A new versatile 50-hp portable steamer, the PS-50, said to do twice the work of previous heaters, is being offered by Cleaver-Brooks Co.

The new unit is a multi-duty steam generator designed to provide quick steam for thawing, cleaning of machinery and buildings, heating tank cars, warming aggregate, and for pile driving.

The new steamer carries its own supplies of fuel oil, water, and gasoline, and is readily towed to the job anywhere that wheels can roll. Doors on the front end open wide to expose engine components, water pump, burner, and blower, thus offering adequate ventilation for cool operation.

The engine is rated at 7½ horsepower at 2,800 rpm.

For further information write to the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis., or use the Request Card at page 18. Circle No. 273.

Portable storage hut

■ The Material Master portable storage hut, made of rolled, corrugated, galvanized-steel shell mounted on a wood flooring, is described in a folder from Material Master, Inc.

The trailer incorporates a ramp tailgate and a manually operated winch, and the hut is easily unloaded when the ramp is dropped. The folder states that the hinged locking plywood doors at the front end of the housing protect against thievery and vandalism.

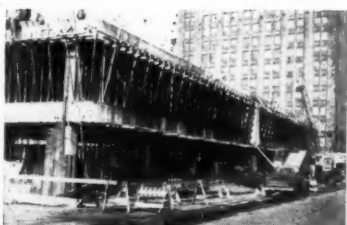
To obtain the folder write to Material Master, Inc., 3508 W. Irving Park Road, Chicago 18, Ill., or use the card at page 18. Circle No. 23.

Road, track unit

■ The Whiting Trackmobile, a unit that converts from a four-wheel road machine to a rail unit in less than two minutes, is featured in a folder from the manufacturer. Working on railway tracks, the Trackmobile is able to haul steel girders, cranes, or other heavy machinery. A switch in the operator's cab lowers the rubber wheels, making the unit suitable for street and highway use.

To obtain Bulletin T-115 write to Whiting Corp., Harvey, Ill., or use the card at page 18. Circle No. 46.

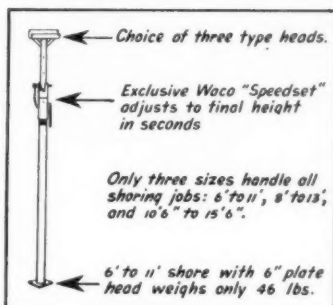
Fast Pouring Schedule Met With New All Steel Shores



Lutheran Brotherhood Building, Minneapolis
Kraus-Anderson—General Contractors

Just nine days between pours is all the time allowed on this six story, 96,000 square foot office building. Over 1800 Waco All Steel Shores were used on the job by General Contractors Kraus-Anderson in order to get the necessary speed without increasing the estimated labor cost.

A crew of 10 carpenters and five laborers set up the 1200 shores for each floor in just four days. Slab and column forms and steel work ready for pouring were finished in another four days. A total of 8,000 yards of concrete were required for the structural portion of the building.



One man can set a Waco shore in ONE MINUTE thanks to the exclusive time saving features shown above. The new WACO design ends splicing, scabbing, and wedging and gives you the maximum of safety and accuracy in the shortest possible time.

For estimates, rentals, and service on all your shoring jobs, contact your nearest Waco scaffolding and shoring expert. He's in the yellow pages of your phone book. Or write to:



Manufacturing Co.
3569 Wooddale Ave.
Minneapolis 16, Minn.

Licenses

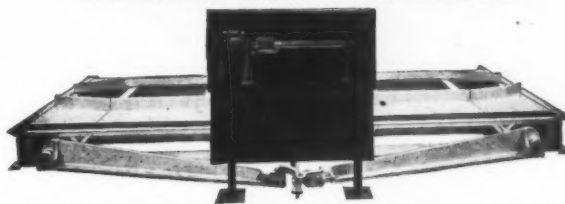
Waco May Co.
Los Angeles

Armstrong Iron Works
Windsor, Canada

For more facts, circle No. 615

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"



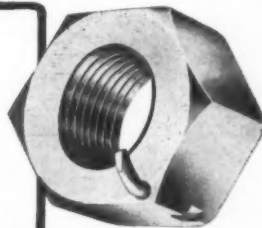
For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons. Write us for name of your nearest distributor

WINSLOW SCALE COMPANY

P. O. Box 1198
Terre Haute, Indiana

For more facts, use Reader-Reply Card Opposite page 18 and circle No. 623

MORE EVERY DAY



ANCO LOCK NUT

ANCO LOCK NUTS are made in all standard sizes from ¼" to 3", either black, or galvanized, with standard U. S. or SAE thread. Also available in brass, aluminum, stainless steel, etc.

ANCO LOCK NUTS are used in all types of steel construction, building, bridges, towers, oil refineries, hangers, road machinery and other machinery.

Write today to Anco for samples, information and prices.

More ANCO Lock Nuts are used every day for Extra Speed, Strength and Savings in Construction.

You couldn't begin to shake loose the fastening that is attained with Anco Lock nuts with any type of vibration or strain AND YET—nut can be removed with an ordinary wrench if necessary and used again. Only one nut is necessary for a permanent connection, or temporary. The nut and lock are a single unit easily installed by one man with an ordinary wrench. The threads can't be stripped and the lock nut can't slip. It will remain in the exact position regardless of vibration.

AUTOMATIC NUT COMPANY, INC.

LEBANON — PENNSYLVANIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 616



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The Trading Post, Contractors & Engineers
470 Fourth Avenue, New York 16, N. Y.

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- 1—Heavy-duty Hayward rock and log grapple.
- 1—2-compartment Cimco batch bin with scales.
- 1—Foley saw filing machine.
- 1—Foley power retoucher.
- All the above like new.
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- 1—10 S Rex mixer, pneu. tires. Good condition.
- 1—Getman Scootcrete. Excellent condition.
- 1—Single drum sheepsfoot roller. Good condition.
- 1—Model G.T. portable Herman Nelson heater.

Write: Wilson Construction Corporation
P. O. Box 946 — Radford, Va.

STOP that WATER

With FORMULA No. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—hold 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs. Applied quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample. HAYNES PRODUCTS CO., OMAHA 3, NEBR.

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BUY used equipment

SELL used equipment

ACQUIRE competent personnel through

The Trading Post Section of
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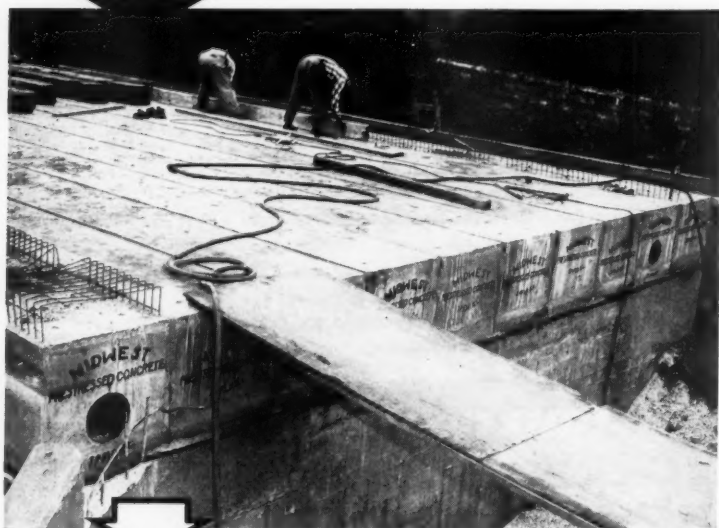
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SONOVoid® FIBRE TUBES for voids in concrete construction

A feature in the design and construction of this bridge was the requirement that it also carry two 10 inch gas mains across the stream. Low cost SONOVOIDS solved the problem. In casting the two outside beams three 13'10" SONOVOIDS were used. Placed in the end sections and at the diaphragms of the beams, they created a hollow throughout the length of the beams providing the carrier for the gas mains.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 618

by HUBERT KELLEY, JR.

The Commerce Department reports that the tempo of industrial construction increased slowly during the first quarter of 1956. Commercial building was also on the rise, with new stores, restaurants, and garages going up at a rapid pace. While some economists were gloomy over the housing situation, the Federal Housing Authority said that proposed home building under its mortgage-insurance program stepped up more than expected during March.

Most significant, perhaps, was Federal Housing Commissioner Albert Cole's restatement of his prediction

that 1,300,000 homes will be started this year. In spite of a slow start this spring, Cole thinks that the pace will build up all year long. "It is my guess," the housing chief said, "that in 1956 we will reverse the pattern of 1955 with the stimulation coming later in the year and building up through the year, rather than falling off as in 1955."

Rep. Albert Rains (D.-Ala.), called Cole's forecast the "wildest kind of optimism."

Last month also saw many other predictions. Education officials said that the nation will have to spend \$3.2

billion a year for the next five years to "provide reasonable satisfactory classrooms", while present school spending is only \$2.4 billion annually. Colleges, too, while making record plans for building programs, think they may have to double outlays in order to handle the expected influx of students in the 1960's. This year, universities will spend about \$750 million for new classrooms, labs, and dormitories.

The price level for federal-aid highway construction went up 1 per cent during the first three months of this year, but is still 3.1 per cent below the

peak year of 1952. Pay scales for union building-trades workers also advanced, with raises for about one-sixth of the nation's construction workers. At the end of March, the estimated average wage for all union construction workers was \$2.96 an hour.

And more wage increases may be in the offing. AFL-CIO witnesses told a Senate Labor Subcommittee that federal minimum-wage laws should be extended to cover about 9.6 million workers now exempt from provisions. Stanley H. Ruttenberg, the union's director of research, said that extensions would cover roughly 1,400,000 construction workers currently excluded from coverage of the Fair Labor Standards Act.

The subcommittee, headed by Sen. Paul Douglas (D.-Ill.), contemplated brief hearings and prompt action. Testimony had been heard from 250 witnesses a year ago.

An \$80 million government loan will probably permit construction of the 2,350-mile Trans-Canada gas pipeline to begin this summer. The money will finance 90 per cent of the cost of building the first 600-mile section from Alberta to Winnipeg.

Financing of the cross-country line has been delayed by a Federal Power Commission hearing in the U. S. Tennessee Gas Transmission is seeking permission to import 200 million cubic feet of gas a day from Trans-Canada for delivery to Minnesota and Wisconsin customers. Presumably, the project would not be feasible without this sale to U. S. customers.

A staff report from the Office of Defense Mobilization suggests that the government refuse to aid private pipeline companies in laying additional oil lines from the Gulf Coast to Eastern markets. From a defense standpoint, says the report, the lines simply aren't needed.

The two companies wanting help, Texas Eastern and American Pipeline, asked for a direct government loan and a government-guaranteed loan plus tax assistance. Government surveys, however, have convinced experts that additional oil can be brought to the East with only minor changes in facilities.

President Eisenhower has asked Congress for \$8 million to start construction of the Colorado River storage project during the 1957 fiscal year. The money would allow builders to begin work on the Glen Canyon and Flaming Gorge units and still have enough left over for advance planning on other projects.

More than \$5 million of the appropriation is earmarked for the Glen Canyon project, where there is an immediate need for access roads and a camp for construction workers. The dam site is in an isolated area just south of the Arizona-Utah border. The first major construction contract, for drilling of diversion tunnels, should be awarded during the last half of the year.

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A FULLY AIR-CONTROLLED 1 1/4-YD. MACHINE

THE NEW LORAIN-56

1 1/4-YD. SHOVEL 25-TON CRANE (as fully convertible machine)

30-TON CRANE (as heavy-duty lifting crane on extra-wide crawlers)

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No centerpin or nut, no rollers to wear. No adjustments! Provides smooth, rock-steady, "ball bearing" swing. Nothing else like it on any other make of shovel-crane.



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Gives the smoothest, most productive power take-off that can be had. Multiplies engine torque. Effectively absorbs digging shocks and strains. No-stall, "never-say-die" power hangs on—maximum work obtained from the diesel engine.



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Now, anti-friction bearings on hoist and swing drums and travel shaft provide the ultimate in performance... smoother, more efficient.



AIR CONTROL OF CRAWLER

Now — air does the work, controls travel, steering, tread lock, swing-travel jaw clutches. Far greater ease of operation. Adds greatly to production.



REMOVABLE COUNTERWEIGHT

New design makes it possible to detach counterweight easily for lower weight when transporting this new Lorain over the highway. Can be removed or installed in minutes.

Here's the newest 1 1/4-yd. shovel-crane, the Lorain-56 —and it has *all* the newest, most advanced features combined into one machine. 2-lever, metered air controls... "Shear Ball" mounting... torque converter... and many, many other *standard* features are included. Operators will like its simple, easy operation and freedom from adjustments. Owners will find the resulting higher production profitable. A few of these outstanding features are briefly described at the left. Get the *full* Lorain-56 story from your Thew-Lorain Distributor now!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

ASK YOUR THEW-LORAIN DISTRIBUTOR FOR FULL DETAILS ON THIS NEW MACHINE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 619

Glen Canyon will be a high concrete dam, similar to but a little smaller than the Hoover Dam. Ashley Dam, part of the Flaming Gorge unit, will be about 500 feet high.

The General Services Administration is displaying its new bidding documents at GSA Business Service Centers around the country. Sample sets contain basic information for bidders and blank copies of the bid forms they will use.

"Instructions to Bidders", the fifth booklet in the series, advises bidders that they may bid in any or all of three different ways: for financing alone, for construction alone, and for both financing and construction.

At present, the GSA building program consists of about two dozen projects with an over-all cost of \$91 million.

That the Senate's housing bill was going to contain something for everybody was a foregone conclusion, with four clauses in particular most likely to be approved by the Senate Banking Subcommittee. In brief, these clauses would lift the ceilings on government-insured home-improvement loans, authorize construction of 15,000 public housing units a year for the next five years for elderly people, permit the FHA to insure 100 per cent of the mortgage on church-built apartments for old people, and extend the military housing program for another three years by raising FHA authorizations \$3 billion to insure loans on housing built by private contractors but owned by the military.

Other provisions are likely to be debated more heatedly. Some senators want to spur building homes for people displaced by slum-clearance projects and would grant builders of these projects up to 100 per cent of the value of the dwellings.

Extending the power of the Veterans Administration to make loans past June, 1957, has been rumored, but housing chief Cole sidestepped one possible piece of legislation by permitting the VA to make more direct home loans to former servicemen. Until now, the VA has had to refer all loan applications to the Voluntary Home Mortgage Credit Committee. In some cases, it was thought that this referral has been hard on veterans.

But no matter what the Senate approves, the House is expected to tailor the bill to meet its own specifications. The Senate had considered 15 separate measures before drafting its own omnibus bill, and House members have even more ideas. Congress will push something through by summer and in this election year, in spite of Cole's objections, it will probably increase the number of housing units.

While agencies and Congress worried over housing, a group of 100 housewives held a three-day Women's Congress on Housing, in which they recommended that builders provide for more rooms, more closets, larger dining rooms, and more play areas for children. Builders listened with

polite interest, but observed that space costs money.

Credit restrictions during the past year have eliminated bank lines for most small manufacturers, according to a report by the Standard Factors Corp., but the survey reports that interest-rate increases have had little effect on bigger companies. In view of this, the report suggests that the Federal Reserve Board reconsider

whether it can afford to maintain uniform credit controls, which affect small and large industries so differently.

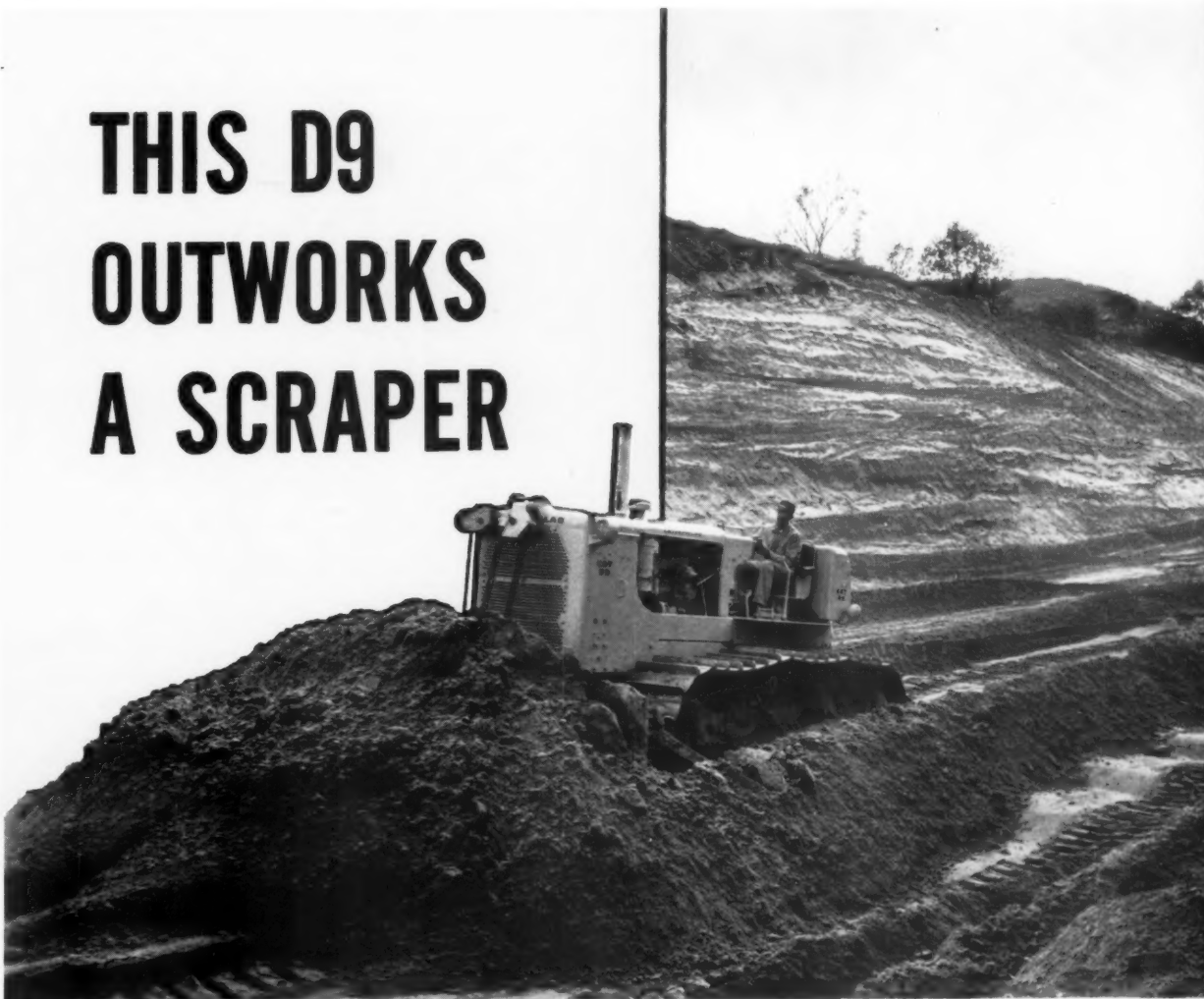
A bill providing up to \$5 billion in federal insurance against flood damage to property is now waiting action by the House of Representatives after having been passed by the Senate by a vote of 61 to 7.

The measure, essentially embodying

recommendations made by President Eisenhower, would be administered through a new Federal Flood Insurance Administration under the U. S. Housing and Home Finance Agency. Losses insured by the federal government would come to not more than \$250,000 for any one policy holder. The limit for each dwelling unit would be held to \$10,000.

THE END

THIS D9 OUTWORKS A SCRAPER



When this picture was taken, last October, Johnson Construction Co., of Grove City, Minnesota, was relocating, widening and reducing grades and curves on U. S. 16 between Rushford and Houston, Minn.

The project covered a distance of 9.8 miles and involved moving 1½ million yards of earth, mostly sand with heavy clay subsoil. The CAT* D9 Tractor with No. 9S Bulldozer is shown at work in a sand cut, 450 feet long and 150 feet wide. It was handling blade loads of from 10 to 15 cu. yd. at a pass and making a round trip every 5½ minutes.

George W. Johnson says: "The power of the D9 adapts it to applications that formerly were handled by scrapers. Its huge dozing capacity definitely puts it in the scraper class, and on this job it's much faster than a scraper. It gives the construction industry packaged power such as we've never been offered before."

Naturally the D9 doesn't replace scrapers for long hauls. But for moving big yardage economically in the

500-foot range there is no machine built that can touch it. This is the first track-type tractor with a Turbocharger. Its 286 HP engine delivers up to 230 drawbar HP. You have a choice of torque converter or direct oil clutch drive, and booster controls make the D9 as easy to handle as smaller tractors. It has "live-shaft" drive to provide continuous power for rear-mounted equipment. Finally, it's ruggedly built, with durability to match its power.

Ask your Caterpillar Dealer for a demonstration of the great D9 right on your own job. He backs every big yellow machine he sells with reliable parts and service. Call him today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**



Big Michigan Tractor Shovel loads out 4,400,000 lbs. of open hearth slag per day

Clearing ground for the Lake Calumet Harbor near Chicago, Contractor C. J. Wilson is removing 700,000 yds. of open hearth slag dumped by neighboring steel mills. This material weighs approximately 4000 lbs. per yd., is extremely abrasive and tough to dig. With one 2¼-yd. Michigan Tractor Shovel, Wilson is loading out 110 trucks per day—10 yd. six-wheelers. That's 4,400,000 lbs. of slag per day!

Does work of 1½-yd. shovel

Wilson says that he couldn't beat this production with a 1½-yd. shovel. Calculating the hourly cost (initial cost, depreciation, maintenance, etc.), of a dragline versus the Michigan, the Michigan does the job at least 40% cheaper. With the abrasive ground

conditions which prevail on the job, Wilson is naturally enthusiastic about being able to do the job on rubber-tires.

"Can't beat the front-end"

Since the first Michigan Tractor Shovel was introduced early in 1954, more and more contractors have found that this machine will handle jobs which they'd never even attempted with rubber tired equipment. Veteran crawler-loader owners, like C. J. Wilson agree that you can't beat the front-end on this machine. It will out-dig any make or type of Tractor Shovel, bar none.

Balanced power and weight

The best way to understand the Michigan's operational advantages is to watch one *ease up to a pile of tough material and come out with a heaping bucket load*. You don't have to ram the pile to get penetration. The Michigan's combination of bucket action, weight and power enables the machine to *dig its way* into the pile. 133 diesel horsepower flows smoothly through the 3-

to-1 torque converter, 4-speed power-shift transmission and heavy duty drive axles right out to four big tires. Planetary gears in the wheel hub eliminate axle breakage... they take 70% of the torque load off the shafts.

Standard on all models

Clark torque converter, power-shift transmission and planetary wheel drive axles are standard equipment on every model in the Michigan Tractor Shovel line—1-yd., 1½-yd. and 2¼-yd. capacity. In each capacity, a Michigan Tractor Shovel will give you more useable digging power and traction than you've ever seen on this type of machine—faster production, lower cost per yard. For proof, ask your Michigan distributor to demonstrate—you name the job.

Michigan is a registered trade mark of

**CLARK®
EQUIPMENT**

CLARK EQUIPMENT COMPANY

Construction Machinery Division
2407 Pipestone Road
Benton Harbor 14, Michigan



Clean design of the Michigan bucket mechanism provides good dumping clearance. Note the heaping bucket load: 40-degree low-level tip-back guarantees heaping loads of any material which can be heaped.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 621

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